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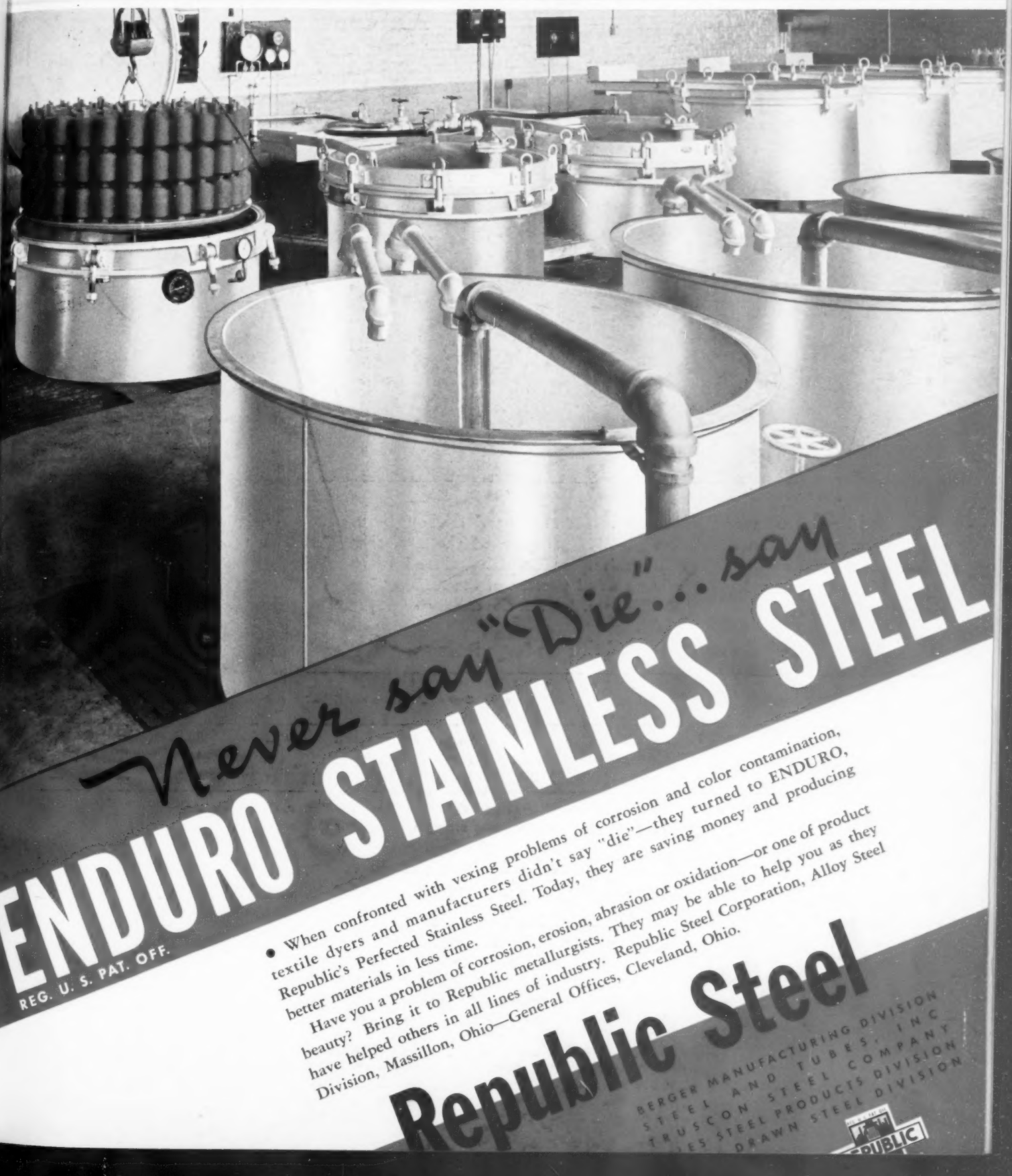
April 11, 1938

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW


Never say "Die"...say
ENDURO STAINLESS STEEL
REG. U. S. PAT. OFF.
• When confronted with vexing problems of corrosion and color contamination, textile dyers and manufacturers didn't say "die"—they turned to ENDURO, Republic's Perfected Stainless Steel. Today, they are saving money and producing better materials in less time.
Have you a problem of corrosion, erosion, abrasion or oxidation—or one of product beauty? Bring it to Republic metallurgists. They may be able to help you as they have helped others in all lines of industry. Republic Steel Corporation, Alloy Steel Division, Massillon, Ohio—General Offices, Cleveland, Ohio.
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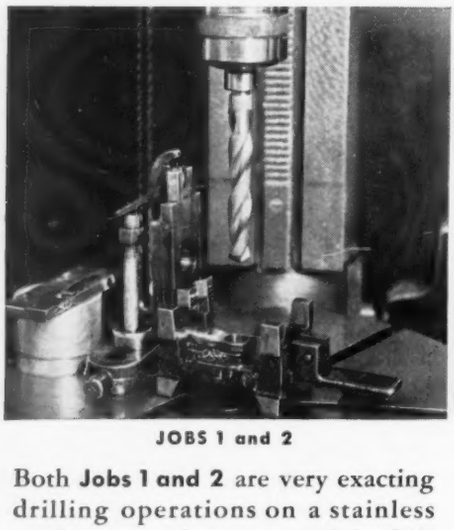
PROGRESS

IN MANUFACTURING DRILLS AND REAMERS

EQUAL OR LOWER DRILLING COSTS

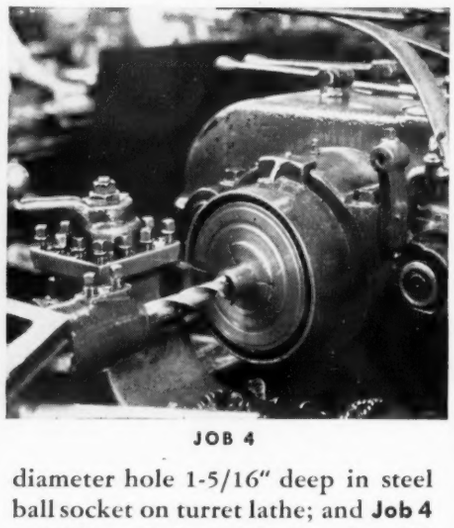
Established by CLEVELAND Under Competition

There they were—Cle-Forge High-Speed Drills and the drills of two other makers, competing on extra-hard jobs for a manufacturer whose product is world-famous. And—to make the tests and analyses equally difficult for all—an independent firm of Engineers was employed to conduct them.



JOBS 1 and 2

JOB 3



JOB 4

Both **Jobs 1 and 2** are very exacting drilling operations on a stainless steel part on the same upright drill press. On **Job 2**, the 51/64" hole must be enlarged accurately to 57/64" in spite of the fact that this operation places all the load on a small portion of the drill cutting edges. **Job 3** is the drilling of a 7/8" diameter hole 1-5/16" deep in steel ball socket on turret lathe; and **Job 4** is drilling a hole 6-3/8" deep in solid steel bar stock—also on turret lathe.

The Engineers making the study reported that Cle-Forge Drills enjoyed advantages in most important respects:

Holes per grind	Job 1 Stainless Steel	Job 2 Stainless Steel	Job 3 Steel Bar Stock	Job 4 Steel Bar Stock
Cle-Forge Drills .	31	39	150	85
Make "A" . .	34.5	20.5	155	25
Make "B" . . .	28	21.5	—	—

Cost of Drills per 100 Holes	Job 1 Stainless Steel	Job 2 Stainless Steel	Job 3 Steel Bar Stock	Job 4 Steel Bar Stock
Cle-Forge Drills . .	$.065	$.060	$.0168	$.0390
Make "A"	.058	.114	.0162	.1325
Make "B"	.072	.109	—	—

Summarizing their entire study, the Engineers reported that Cle-Forge Drills effected savings of $2.75 per drill on Job 2 more than either of the others, and savings of $12.72 per drill over others on Job 4.

Do not these outstanding records by Cleveland Twist Drills and Reamers emphasize that, whatever *your* product, metal, or operating conditions, you should talk with an experienced Cleveland Representative? We shall be glad to send him on request.

The CLEVELAND TWIST DRILL COMPANY
1242 EAST 49th STREET
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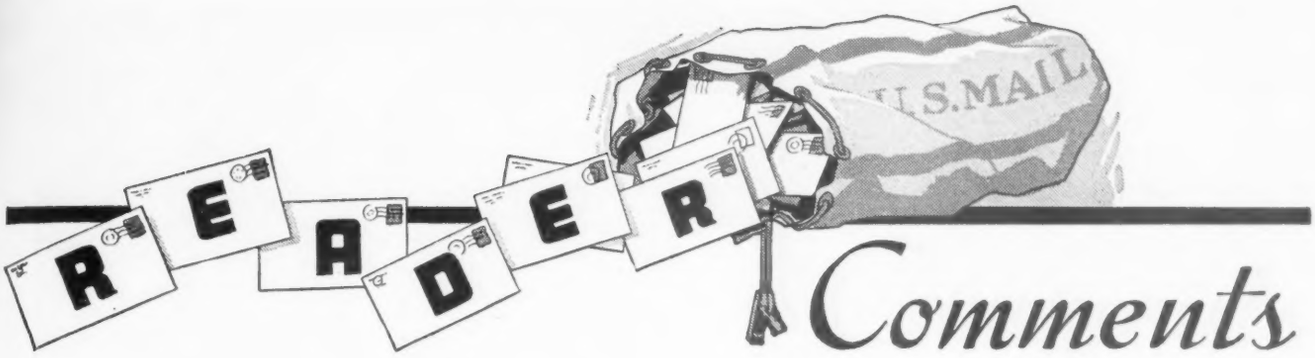


Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Against Patent Bill

To the Editor:

The following letter has been sent by our company to Dr. William I. Sorovitch, chairman of the patents committee of the house of representatives, stating our opposition to the theory of proposed legislation in the McFarlane compulsory license bill, H. R. 9259:

"Such legislation would be a most effective, unnecessary and undesirable impediment to progressive effort in industry.

"It would act as a fruitful creator of additional hazards to any extensive research and development work in industry. There are plenty of such hazards now. The industrial organization which attempts to keep a step ahead of the procession by rendering real services to its trade, and ultimately to consumers, is not largely interested in royalties; it is interested in having the privilege of manufacturing, selling and distributing the products of its own development, thereby compensating itself for the tremendous prior expense of such effort, which must always be paid for in advance.

"It would tend to destroy inspiration along the lines of research and development, not only by organizations but by those constructive minded individuals who are willing to devote years of their lives to prepare themselves for engineering work when other young men of their own age, with other ambitions, are shooting craps. These engineers, individually by isolated effort, could no more attain adequate results in these fields than could the early American Indian build an automobile or a battleship. Yet, this bill says, in its ultimate effect, that an organization employing a dozen, a hundred or a thousand of such able personnel, shall be restrained from any effort or method to reimburse itself for earnings plowed back into research and development work.

"We have long since ceased trying to discover any constructive purpose for the benefit of our nationals as a whole in proposed legislation constricting the efforts of industry by these and similar methods, but it is our understanding that somewhat similar laws relating to patents and in effect in a few other countries have just not worked. By sufficiently arbitrary enforcement it might be made to work here, but only to the detriment of progress, of industry and of all our people. For, believe it or not, industry serves all the people. To the extent that industry in general is not permitted to thrive, those whom it now serves will be the losers. Today all our people are served by industry in the supply of every human need down to those most intimate and necessary to the American standard of living.

"As chairman of this important committee, we solicit your co-operative consideration."

A. W. MACE

Assistant to President,
Ludlum Steel Co.,
Watervliet, N. Y.

More Light on Tariff

To the Editor:

The letter captioned "Trade Must Be Balanced" appearing in your issue of March 28 contains inaccuracies.

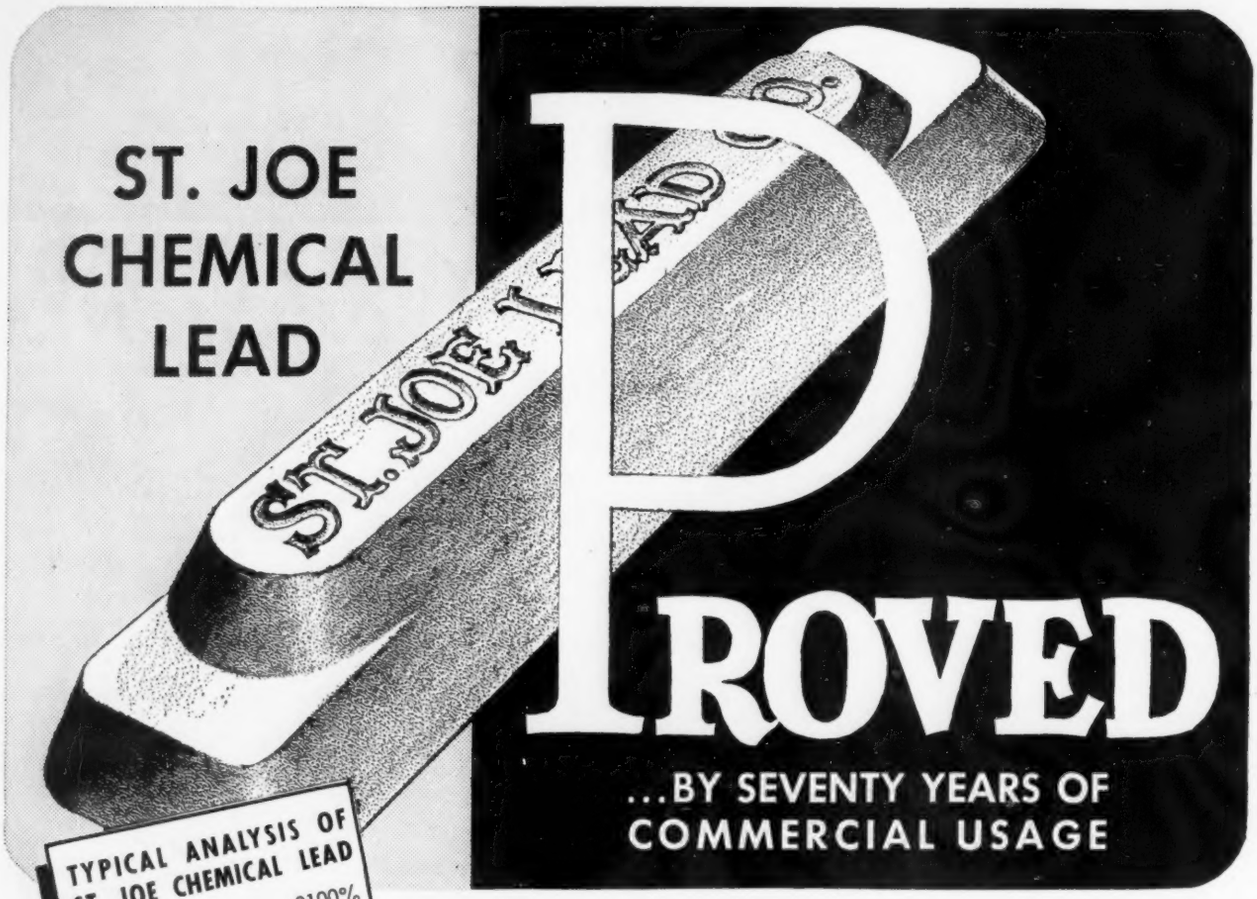
The example on knives is taken from the highest possible bracket in paragraph 355, which includes such articles as table, butchers', carving, cooks', hunting and similar grades. However, pocketknives, which have a blade of less than four inches in length, exclusive of handle, are assessable at 2 cents each plus 45 per cent ad valorem. If the price paid abroad was 40 cents retail, it is reasonable to assume that the foreign wholesale value was approximately 20 cents. As ad valorem duties are levied on the foreign wholesale value, the total compound duty would rightfully have been as follows: specific duty 2 cents, ad valorem duty (45 per cent) 9 cents, total 11 cents. If the 40-cent price was "wholesale," then we have specific duty 2 cents, ad valorem 18 cents, total 20 cents. Either the author doesn't know his tariff law or the customs official put something over on him.

Our total international trade in 1937 was: Exports $3,294,916,251 and imports $3,012,486,953, leaving an apparent favorable balance of trade of $282,429,298. Figures for the exports of war materials and supplies during last year are given as $776,084,094. This unusual amount, which can in no wise be included in our efforts to secure peace and "good neighborliness," represents materials purchased irrespective of whether we have reduced tariffs by negotiating reciprocal trade agreements. Foreign nations made these purchases because they had to have the materials and not because of any grateful attitude.

Another factor commonly overlooked is the "difference in value" basis of our import and export statistics. Import figures are based upon the value in the country of origin, while export values are based upon American prices. The value of all imported merchandise, in terms of American prices, would be at least 20 per cent higher than the stated value and on many commodities as much as 100 per cent. What should be emphasized is that a balance of trade, i.e., equality be-

(*Please turn to Page* 108)

ST. JOE CHEMICAL LEAD



TYPICAL ANALYSIS OF ST. JOE CHEMICAL LEAD

Silver	.0100%
Copper	.06
Bismuth	None
Zinc	.0003
Iron	.0005
Arsenic-Antimony-Tin Combined	.0012
Cadmium	.0023
Nickel & Cobalt	.0046
Lead by difference	99.92+

SINCE 1865, St. Joe Lead has been specified for use in contact with corrosive chemicals. This is the origin of the term "Chemical Lead." Since that time, St. Joe Chemical Lead has been specified in ever increasing tonnages, until today it is the most extensively used brand in the chemical industries. The reason for its continued use is the long life and satisfactory service which it gives. The experience of the Grasselli Chemical Company at their Beaver Falls, Pa., chamber process plant is typical. St. Joe Chemical Lead was used in the construction of the chambers. These were dismantled after some 32 to 47 years exposure to sulphur dioxide gas and sulphuric acid. The small loss of weight of the sheet, as shown by the following table, is a striking testimonial to the corrosion resistance of St. Joe Chemical Lead.

Chamber	Built	TOP		SIDE	
		Original Weight	Present Weight	Original Weight	Present Weight
1	1899	6 lb.	5½ lb.	6 lb.	6 lb.
2	1899	6	5¼	6	5¼
3	1884	6	5¼	6	6
4	1884	6	5½	6	5¾
5	1884	6	5¾	6	6

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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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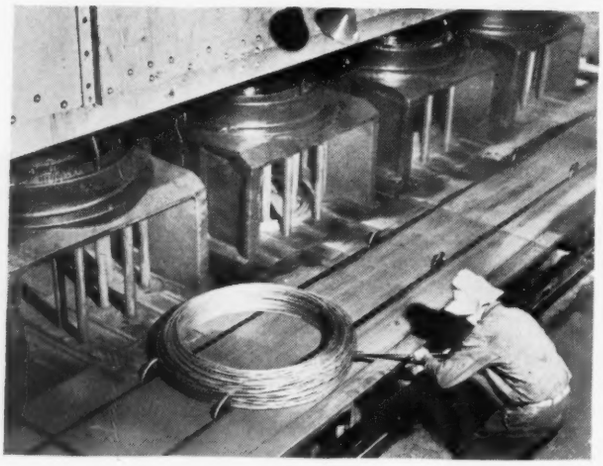
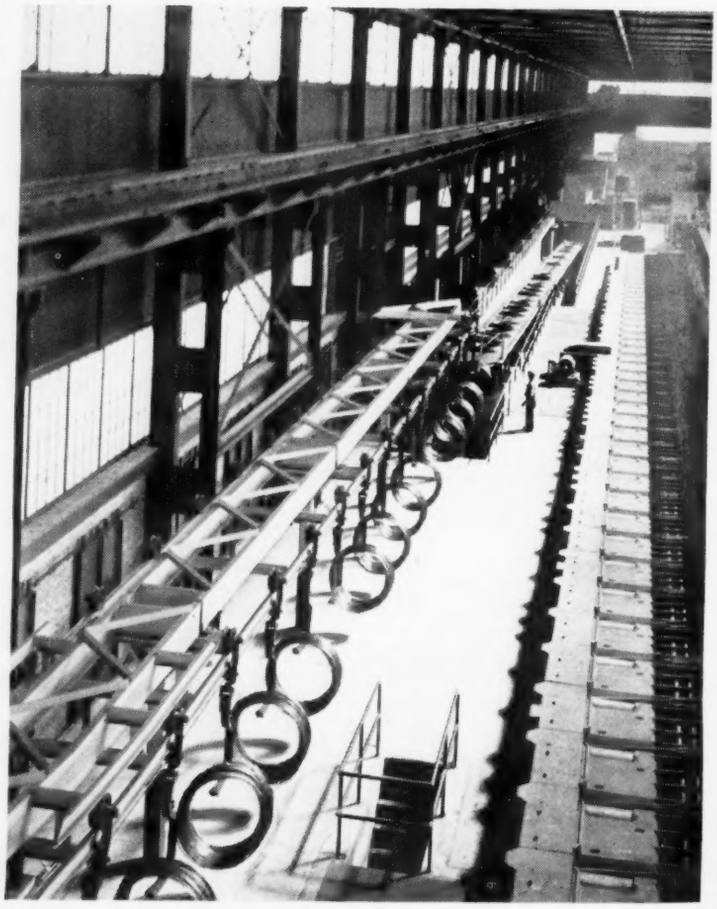
PRODUCTION · PROCESSING · DISTRIBUTION · USE

Continuous Rod and Merchant Mill





Four strand continuous rod roughing and intermediate mill with repeaters and looping stands feeding directly to hot run-out and double carry-over bed, or through rod finishing train to laying reels, coil conveyor and hook carrier system.

DESIGNED AND BUILT BY

MORGAN
WORCESTER
ENGINEERS AND
MANUFACTURERS

R38

As the Editor Views the News

■ STEEL'S annual compilation of the financial returns in the steel industry shows (p. 42) that companies controlling more than 90 per cent of the industry's capacity earned $242,058,038 in 1937 and earned a net profit of 6 per cent on invested capital. . . . The story for 1938 will be far different. Steel output again dropped last week (p. 29) to 32 per cent of ingot capacity and observers now expect no material improvement prior to the fall months. But well-informed steelmakers continue to believe that 1939 will be a good year. History shows that recovery invariably has sprung from summer lows and not from year-end bottoms. . . . Output of automobiles increased to 60,975 units during the week ended April 9, a gain of 3475 over the preceding week.

• • •

When Myron C. Taylor last week relinquished the reins in the United States Steel Corp. a hitherto unannounced action developed. Benjamin F. Fairless (p. 26) was named chief administrative officer of the New Jersey corporation as well as re-elected president of the New Jersey and Delaware corporations. The new "big three" in the Steel corporation thus are: Edward R. Stettinius Jr., chairman, Mr. Fairless and Enders M. Voorhees, chairman of the finance committee. Mr. Taylor's report, unique in detail, scope and philosophical undertone, revealed clearly the difficulties under which managements now function. He made it plain that the price system in the steel industry under present conditions is less than flexible, for the area of price discretion is negligible.

"Big Three" In Steel

• • •

Recently the American Institute of Steel Construction sponsored a contest for types of elevated highways to relieve congestion and speed traffic in large cities. Altogether 273 designs were submitted. First prize of $5000 (p. 60) has gone to a Chicago engineering firm. . . . STEEL'S survey of tin plate prospects indicates (p. 23) 1938 production will be around 2,000,000 tons, compared with the record 2,462,763 tons in 1937. . . . Pennsylvania in 1937 again retained its lead (p. 32) as the most important pig iron producing state. . . . In Cleveland, May 14-19 the American Foundrymen's association will hold its forty-second annual convention. A comprehensive technical program has been arranged and 200 exhibitors will participate in the Foundry show. . . . Indications of fresh pump-priming are seen at Washington.

Developing Highways

• • •

A good way to start an argument with a customer is to allow him to accept a quotation which fails to specify definitely those factors which may be subject to misunderstandings. One manufacturer, after careful study, has adopted a method of quoting (p. 46) which leaves nothing to controversy. It covers all such matters as tolerance, ownership of tools, finish, minimum charges, delivery promises, patent infringement, design responsibility, cancellations and others. . . . Notable developments in the materials handling field are new ram trucks for handling welded coils of wide strip steel. Latest innovations (p. 57) include exceptionally short wheelbase and overall length for the capacity, and a combination drive unit and motorized steering turntable on the rear wheels.

Avoiding Controversy

• • •

Unionmelt process of welding, using high current, bare wire coiled electrode and welding under a heavy protective layer of flux, is coming into wider use in making long, continuous joints. It is fast and gives deep penetration and solid, homogeneous deposits. The process was used to advantage in recent construction (p. 66) of a Pacific coast water line fabricated from heavy steel plate. . . . A leading automobile manufacturer (p. 63) uses new base, thinners and pigments for longer retention of life and luster in finishes. . . . Life of threaded joints in galvanized pipe is prolonged (p. 64) by a new process in which the threads are galvanized. . . . Comparatively new, the incandescent electric carbon brazing method is proving useful (p. 70) in a wide variety of applications.

Rapid Welding

E. L. Shaner

It's Time to Look Up!

What strikingly new sales possibilities await the decision to re-design and improve one or another of your company's products?

Have you considered the advantages of using specially finished Inland sheets, corrosion-resisting Inland Copper-Alloy or weight-reducing Inland Hi-Steel?

An unusually large number of manufacturers are pressing these opportunities right now. Inland engineers, metallurgists and laboratory technicians are assisting them.

If you agree that now is the time to look up and ahead to better business, secured through giving the customer something more appealing and satisfactory for his money, then please confer with our nearest district office where experienced and sincerely co-operative personnel stands ready to help you through development of the best steel for your purpose.

INLAND STEEL CO.

38 SOUTH DEARBORN STREET, CHICAGO
DETROIT • KANSAS CITY • MILWAUKEE • ST. LOUIS • ST. PAUL

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES
STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Broadening Field for Containers Gives Tin Plate Unmatched Stability

■ TIN PLATE, always a consistent and important factor in steel production, will do its share to sustain output in 1938. Whether general business is good or dull this product holds to a fairly steady level, with slight fluctuations and a generally ascending trend line.

An important reason is that half the tonnage is used for making cans for food, slightly less for other containers, and the remainder, about 10 per cent, for miscellaneous purposes.

Prospects for tin plate in 1938 are excellent, though production probably will not reach the record level of 1937, when 2,462,763 gross tons was manufactured.

From 1925 to 1935, inclusive, output varied from 1,392,227 tons in 1931 to 1,816,223 tons in 1929—except that in 1932, the bottom of the depression, it dropped to 986,217 tons. Probably no other steel product can show as good a record through the same years. In 1936 production mounted to 2,103,153 tons.

Tin plate was produced at the rate of 83.2 per cent of capacity in 1937. At present the rate is about 60 per cent, with indications seasonal requirements will lead to an increase shortly. The contrast between this and general steel operations at 30 to 35 per cent is striking, and illustrates the relatively stable situation in tin plate.

Record Exports in 1937

A factor in the heavy output in 1937 was export demand, largest on record. For export, 388,695 tons was manufactured, while 354,339 tons was shipped. Disparity of the figures is due to the lag between manufacture and actual shipment. Average price of the exported product in 1937 was $111.29 per ton, compared with $99.79 in 1936, and $110.31 in 1929. Total value in 1937 was $39,435,467, highest of all export items.

Exports have slackened this year, with 19,073 tons in January and 15,063 tons in February, considerably under the monthly average of 29,000 tons last year. However, shipments abroad in 1937 were unusually high and the rate this year is considered nearer normal.

An important factor is constant research by tin plate users, notably can manufacturers, resulting in a larger variety of uses. Among important additions are sanitary cans for packing baby foods, oil, beer and cat and dog foods. Tests now in progress in the use of tin cans for ginger ale and grape juice promise further expansion.

Public Taste Affects Demand

Another consideration in demand for food containers is the change in public taste. An example is found in the recent increase in use of pineapple juice, formerly an insignificant item, now rivaling canned pineapple. There has been a similar development in the use of tomato juice, and other food products.

Manufacture of cans now absorbs about 90 per cent of all tin plate made in this country, 55 to 60 per cent of this being in the classification of cans for food. Estimates of 1938 food crops indicate volume equal to that of 1937.

The remaining 40 to 45 per cent of can production is in "general line" cans, including friction-top cans for oil, turpentine, syrup, paint, coffee, tobacco, and small medicine boxes. "General line" cans reflect to considerable degree overall business conditions. Estimates in the first quarter were for a reduction of 5 per cent in demand for "general line."

Some of the higher grades of oil are sold in tin containers, the cheaper grades in bulk. Hence, when automobile owners economize there is less demand for canned grades.

About 30 per cent of tin plate goes into "general line" cans and this, with the 10 per cent used in miscellaneous manufacture, must bear most of the decline caused by depressed business. In general, however, it seems likely that 2,000,000 tons of tin plate will be made in 1938.

Tin plate capacity Dec. 31, 1936, was 2,961,812 tons. Since then mills

■ **Tin Cans and Dancers. Puppet ballet girls posed before puppet audience—one of many novel exhibits placed where container-sales opportunities lurk. Ninety per cent of the tin plate made in the United States now is used in making food and "general line" cans.** *Photo, courtesy, Continental Can Co.*

with a total of 830,000 tons have been completed, latest being that of Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Mills now under construction will provide an additional 412,000 tons. These will bring total capacity to 4,142,000 tons, an increase of 42 per cent over the 1936 figure.

Tin plate production was started in this country about 1874 but at first was not profitable. Improvements in the Welsh industry having pointed the way, American interests in 1891 built a mill which was successful and in a short time others were started in Pennsylvania and Ohio. Within a few years the automatic canmaking machine was perfected and this gave the tin plate industry its greatest impetus.

In 1901 exports amounted to 610 tons. By 1908 they had increased to 15,010 tons, and in 1911 to 61,381 tons. In 1916 exports totaled 227,391 tons. From that time the United States has held an important position among exporters. Exports since 1901 total about 5,000,000 tons.

The tendency in recent years has been for establishment of tin plate works in numerous countries formerly buying supplies from the United States and Wales, but the increasing demand from the world in general has been sufficient to overcome this loss and hold exports at a high level.

273 Designs Submitted in Elevated Highway Contest; Plans Exhibited

■ ELEVATED highways to relieve congestion and to speed traffic through densely populated cities can be designed not only economically but aesthetically.

This was proved by the 273 designs submitted in the competition just held by the American Institute of Steel Construction.

Leading architects and engineers of the United States and eight foreign countries joined in submitting ideas.

In view of the general excellence of the designs, even of those which won no prizes, all of the drawings were placed on public exhibition last Friday, at 200 Madison avenue, New York. This will be continued until Thursday night, April 14.

First prize, $5000, goes to Hazelet & Erdal, consulting engineers, Chicago. Theirs was a streamlined design supporting a four-lane roadway upon a cantilevered floor beam supported on a central bent, the spread of the legs of which is sufficiently close not to impinge upon, but forms a center safety zone upon the street below.

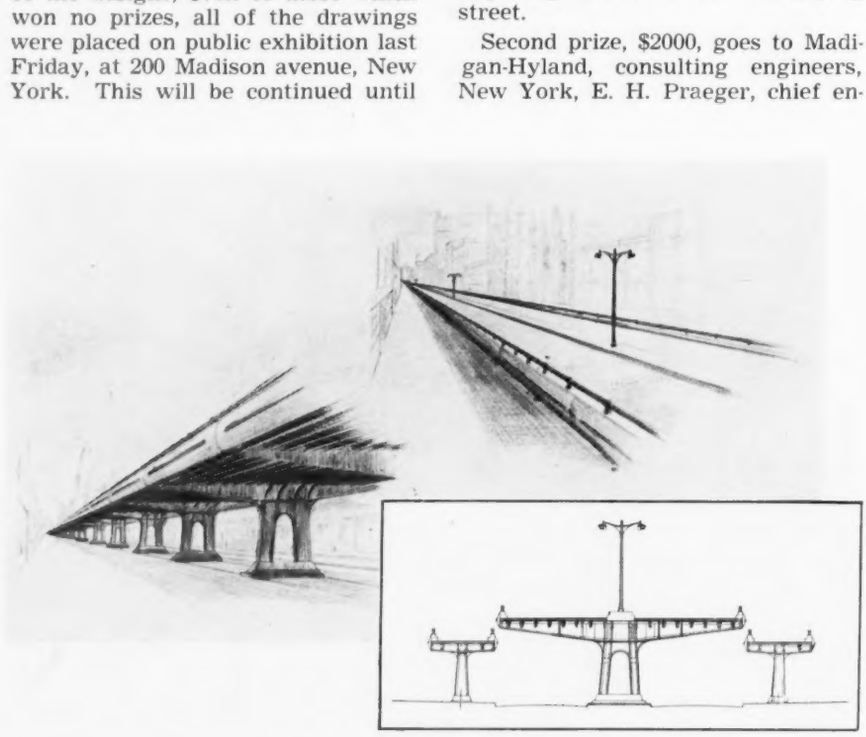
Such a design, it was felt, could be erected without causing consequential property damage and without impeding traffic on the underlying street.

Second prize, $2000, goes to Madigan-Hyland, consulting engineers, New York, E. H. Praeger, chief engineer, and C. F. Lloyd, architectural designer. The design they submitted was that actually built for the portion of the new Henry Hudson parkway between St. Clair place and 135th street, New York.

Third prize, $1000, goes to Walter W. W. Jones, engineering illustrative designer, department of borough works, Manhattan, N, Y. The jury awarded honorable mention and $100 in cash to each of 10 others.

Leading traffic authorities have concluded that the only permanent solution of the joint problem of accidents and congestion is through construction of major traffic routes particularly adapted to operating characteristics and potentials of the automobile, according to the institute. They have projected a type of highway design to have the following features:

1. It provides for a complete physical separation of streams of traffic moving in opposite directions.
2. It eliminates any direct access to abutting property.
3. It provides for an elimination of all intersections through a complete and continuous separation of grades.
4. It provides decelerating lanes for vehicles slowing to leave the highway at specially provided exits and accelerating lanes for vehicles entering from specially provided entries.



■ **Wins first prize, $5000, in American Institute of Steel Construction's contest to develop the most suitable designs for elevated highways. Inset is a cross section of highway and ramps**

War-Scarred Flag To Hang in Home Office

■ Graton & Knight Co., Worcester, Mass., has received a bullet-riddled American flag which flew over the company's Shanghai factory for four months during the Sino-Japanese conflict. E. A. Nelson, export sales manager, who was in Shanghai during the fighting, sent the flag to Worcester with the comment:

"It has served to notify Chinese and Japanese soldiers that the property over which the flag waved was American property and since the building was not looted and is still standing with only a little damage done to it, I believe the flag is entitled to some credit at least. It has occurred to me that the flag deserves being hung in the reception room in the G. & K. administrative building at Worcester."

Offer Metal Fellowships

■ Two fellowships in metallurgy, each carrying $600 stipends and exemption from all fees except nonresident matriculation and diploma, are offered by the Michigan College of Mining and Technology, Houghton, Mich. Projects to be considered are copper base alloys, fundamental physical metallurgy, and ore dressing. Applications must be made to the registrar by April 15.

Sharp and Puzzling, Industry's View Of Labor Board's Pro-SWOC Order

■ LAST week's decision by the national labor relations board charging Inland Steel Co., Chicago, with unfair labor practices was widely hailed as setting a new high in the board's pro-SWOC activities.

Essentially the board ordered Inland to bargain collectively with SWOC as exclusive representative of its employes and if understandings are reached "to embody such understandings in a written, signed agreement." The company also is ordered to withdraw all recognition from the Steel Workers Independent Union Inc. and "completely disestablish" that union.

Compliance with the board's order would give to the SWOC practically everything it asked and failed to get in last summer's strike at Inland plants.

Headed for Courts

Inland officials late last week were not ready to make any statement regarding its next move in the case. Most observers, however, believed the issue was headed toward the courts for a real test of the labor board's power.

As in former labor board orders, last week's decision presented several puzzles. Although SWOC membership in Inland plants has not been determined, the board apparently accepts the union's claim of a majority, and orders the company to deal with SWOC as exclusive collective bargaining representative.

The decision, handed down April 6, orders the company to cease and desist:

From dominating, interfering with or contributing to the support of Steel Workers Independent Union Inc., or any other labor organization of its employes;

From refusing to bargain collectively with the Steel Workers Organizing committee as the exclusive representative of all laboring employes;

From interfering with, restraining or coercing employes in participation in union activity, as set forth in section 7 of the Wagner act.

Inland is ordered to take the following affirmative action:

Withdraw all recognition from the independent union as representative of any of its employes and completely disestablish that union;

Bargain collectively with SWOC as the exclusive representative for labor employes, in respect to rates of pay, wages, hours, and other conditions of employment, and, if an understanding is reached, "embody said understanding in a written, signed agreement for a definite term, to be agreed upon, if requested to do so by the Steel Workers Organizing committee."

Company was ordered to notify the regional director of the board within ten days what steps the company has taken to comply with the order.

STEEL FOUNDRY WORKERS VOTE AGAINST UNION

In a labor board election at the Ohio Steel Foundry Co.'s Lima, O., plant, April 6, 62 per cent of eligible employes voted against representation by AFL's International Molders' Union of North America, Local No. 159. The question was simply whether or not they wished to be represented by this union. The CIO had withdrawn from the plant and no company or independent union was involved. Of 418 employes eligible to vote 217 were opposed and 135 in favor of union representation.

CITE RIGID WAGE RATES AS RETARDING FACTOR

Business recovery based on reduction of industrial costs and prices cannot begin until there is substantial reduction in wage rates, the major factor in costs. This is a conclusion of Allen W. Rucker and R. W. Pickering, business economists, in "Rigid Wage Rates and Costs," latest of a series of economic bulletins published by Farrel-Birmingham Co. Inc., Ansonia, Conn.

The study places responsibility for unemployment and depression squarely upon present political interference.

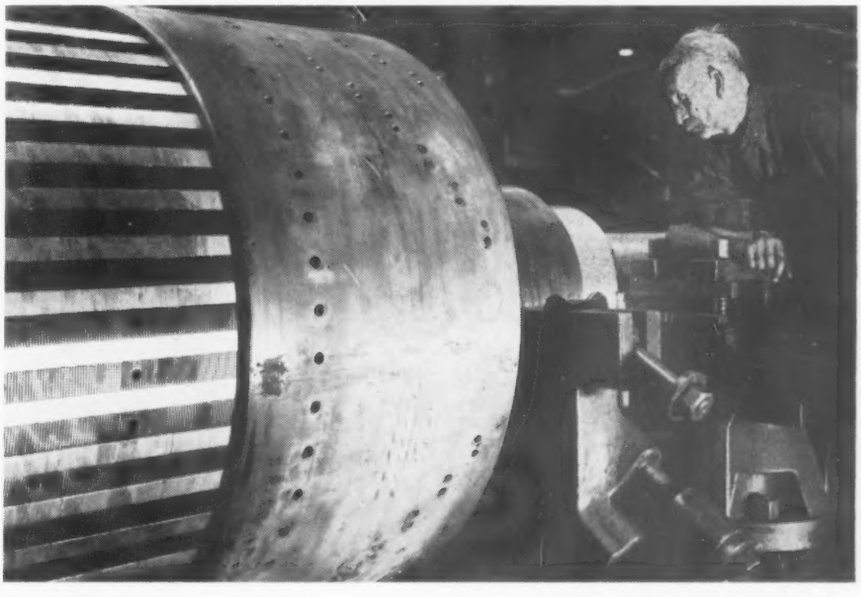
"The theory that high wage rates create purchasing power and higher wage rates generate still more purchasing power in a sort of economic perpetual-motion operation has received a rude shock."

Cited are National Industrial Conference board data showing hourly wage rates increased 12.2 per cent during 1937 and that actual weekly earnings at the close of 1937 were 8.5 per cent below December 1936. Average work week was reduced 18.4 per cent, number employed was 7.5 per cent less, and total manhours was 24.6 per cent lower.

Driver-Harris Resumes

■ Difficulties between Driver-Harris Co., Harrison, N. J., and the CIO, resulting in the closing down of the plant for three weeks, were settled April 5. The plant has resumed operations in all departments. Production of alloy castings and alloy wire is again on a normal basis, and immediate deliveries of wire are being made from stock carried at Harrison, Chicago, Cleveland and San Francisco.

Building Turbine Generator for Inland Steel



■ **Finishing operations on a journal for a 25,000 kilovolt-ampere turbine generator, being built in Westinghouse Electric & Mfg. Co.'s East Pittsburgh works for Inland Steel Co., Chicago. The rotor is 4 feet in diameter, 26 feet long, and weighs 32½ tons. It will spin at a rate of about 1385 revolutions per minute**

New U. S. Steel Executive Pattern Much Like That Ten Years Ago

■ WHEN Myron C. Taylor stepped down last week, after guiding the United States Steel Corp. through ten difficult years, there was a development unheralded in what otherwise was the fulfillment of a definitely indicated program.

Benjamin F. Fairless was named chief administrative officer of the New Jersey corporation, as well as being re-elected as president of both the New Jersey and Delaware corporations.

With 38-year-old Edward R. Stettinius Jr., chairman, and Mr. Fairless in his new administrative capacity, the situation closely parallels that which followed Judge Elbert H. Gary's death in August, 1927. Then J. P. Morgan became board chairman, and James A. Farrell, president, assumed the administrative duties.

There is a further parallel, for last week Enders M. Voorhees, 46, became chairman of the finance committee, the office Mr. Taylor assumed in 1927.

Active direction of corporation affairs again rests largely in the hands of three men, with one of the three, as previously was the case, a seasoned steel man, and the other two relatively newcomers to the industry. Incidentally, it is a much younger group, age averaging slightly over 43.

Still available for counsel and advice, however, are Mr. Taylor, who will continue as a director, with offices at 71 Broadway, and William A. Irvin, who was president until the close of last year and is now vice chairman of the board — also several other veterans on the board.

At the directors' meeting last Tuesday, all these changes were formally approved. Philip Ream Clarke, Chicago banker, was elected a director to succeed the late E. J. Buffington.

Presents Detailed Report

Mr. Taylor's report on his stewardship was unique in its detail, scope and philosophical undertone. In a 16,000-word summation he traced the corporation's affairs through the most critical period of its existence, and discussed trends and problems of the steel industry as a whole.

He reviewed the renaissance of the corporation, which, he said, has made it "an instrument of greater value to its owners, its workers and the public," a diversified producer of virtually every type of steel, which he considered its greatest guarantee of stability.

"It has been a stirring adventure to lead the corporation army of about 500,000 people — more than half of them being workers and the other half stockholders, with some 40,000 both workers and stockholders — through these years when economic forces of resistless power have been sweeping us hither and yon."

Mr. Taylor said great changes in the economy of the country presented one set of problems, while the financial exigencies of the depression presented another. He spoke of the period when NRA and AAA were in effect.

For a time the nation operated under a new economy that reached after a substitute for competition. That period had social consequences which still find expression in the Guffey Coal act, the Robinson-Patman act, the Miller Tydings act and other statutes.

He commented upon the change from the gold standard to a managed currency, saying the full effects are still obscure. Heavier taxes, as well as new forms of taxes, have altered both cost and budget factors of doing business. Under the Wagner act the relations between employer and employe have been placed on a new, but indefinite, footing.

Corporation's Goal Is Efficiency

Mr. Taylor spoke of his many trips to Washington. "My mission has not been to seek any special advantage for the corporation, nor merely to keep it within the law, but to attune its policies to national policies as part of the corporation's obligation of citizenship."

In discussing trends, he said the character of steel consumption has changed sharply. "For instance, steel rails, which had amounted to 23 per cent of the national production at the time of the corporation's formation, dropped to 8 1/3 per cent in the 1928-29 period, while sheet and strip, which accounted for only 6½ per cent in the early period, rose to 19 per cent and tin plate, from 3.3 to 5 per cent.

"In 1936 steel rails accounted for only 3½ per cent of the country's output, while sheet and strip rose to 31 per cent, and tin plate to 8 per cent."

To cope with this, the corporation spent $562,569,358 between Jan. 1, 1928 and Dec. 31, 1937, for modernization, additions, etc., and at the end of the year there was unexpended $80,000,000, making a total of $642,569,358.

In most instances the new equipment has a somewhat larger capacity than equipment replaced, but the additions, Mr. Taylor said, have been incidental to the main objective — efficiency. In the past ten years

Three U. S. Steel Presidents Attend

■ Left to right in the group: William A. Irvin, who was president from April 18, 1932 to Jan. 1, 1938, and who is now vice chairman of the board; James A. Farrell, president from January, 1911 to April 18, 1932; and Benjamin F. Fairless, who became president Jan. 1, 1938, of both the New Jersey and Delaware corporations. Next to Mr. Fairless is E. R. Stettinius Jr., now chairman of the board, and at the right, George A. Sloan, a director

the corporation has abandoned nearly 5,000,000 tons of capacity, while new facilities built or under way will have a capacity of about 6,000,000 tons.

He revealed the corporation has to pay out half of every dollar it receives, in order to do business.

"The amount," he explained, "so paid out, however, with the exception of taxes, is nearly all made up of wages, for those from whom U. S. Steel buys must in turn pay wages."

Later on he remarked if the corporation has no control over 50 per cent of the amount it receives, and if 84 per cent of the balance remaining must go for wages, its price system must be less than flexible — for its area of price discretion is negligible.

He analyzed the corporation's labor policies and told the inside story of his negotiations with John L. Lewis. Referring to the problem all industry faced in 1936, he said, "it seemed to us that the situation was one in which our principles of representation exactly applied and that the grave danger was in allowing events to proceed to a point where the ordinary rules of reason would not govern.

"I felt it was my duty as a trustee for our stockholders and as a citizen to make any honorable settlement that would insure a continuance of work, wages and profits. I discovered that Mr. Lewis was similarly minded. . .

"The union has scrupulously followed the terms of its agreement and, in so far as I know, has made no unfair effort to bring other employes into its ranks, while the corporation subsidiaries, during a very difficult period, have been entirely free of labor disturbance of any kind. The cost of a strike — to the corporation, to the public and to the men — would have been incalculable".

Stockholders approved alterations in the capital structure, providing for an increase in the capital stock to 15,000,000 shares with no par value and a bookkeeping value of $75 a share. The board also was authorized to issue convertible debentures when conditions are satisfactory and funds are required.

Change Capital Structure

In favor of changes in the capital structure were holders of 2,808,997 preferred shares and 6,321,153 common shares; opposed were holders of 119 preferred and 3296 common.

Concerning capital structure changes, Mr. Taylor explained common stockholders would suffer no loss. Intrinsic value is not changed, only par value. Change of par value and the other proceedings in relation to it are, he explained, precautionary "because of uncertainties of the times, and because of a desire to have your corporation put in a position where under any circumstances that might arise it would be possible to care for your interests in the best judgment of your board of directors."

Supplementing, Nathan L. Miller, general counsel, said there is a reduction in the book value by writing off an item called "intangibles", at present amounting to $260,000,000, although it has been a great deal more. Take that $260,000,000 out, he said, and the directors will be able to act prudently on what the books show. He added that common shareholders might get a dividend sometime in the future, which the directors could not prudently declare under the former setup.

Toward the close of the meeting, Mr. Taylor introduced James A. Farrell and William A. Irvin, past presidents, and the new officers and others seated at the head table. Resolutions of tribute to the retiring chairman were warmly approved.

Retiring directors re-elected for 3-year terms included Mr. Fairless, Mr. Irvin, Mr. Voorhees, William J. Filbert, Leon Frazer, and Junius S. Morgan.

Regular quarters in the Hudson Trust Co. building, with a seating capacity of approximately 200, were jammed. As many as 500 to 600 stockholders were present at one time or another during the meeting which lasted fully two hours longer than usual.

Ten Critical Years—and Pie

■ **Although seating capacity at the stockholders' meeting quarters in Hoboken, N. J., was limited to 200, as many as 500 to 600 were present at one time or another, to hear as best they could Chairman Taylor's report on his ten-year stewardship of U. S. Steel. Chairs were at a premium. As usual, sandwiches, pie and coffee were served at lunch time**

350 Engineer Students Visit Carnegie-Illinois

■ Three hundred fifty freshmen engineers at Carnegie Institute of Technology, Pittsburgh, were guests of Carnegie-Illinois Steel Corp. for an all-day plant inspection tour last week. They saw blast furnace operations at the Duquesne works; physical testing laboratories, open hearths and shape mills at the Homestead works, and the 100-inch mill at West Homestead.

Preliminary to the inspection, J. L. Perry, president; K. H. McLaurin, general superintendent, Homestead; and L. A. Estes, of the commercial division, and tour arranger, spoke on production, management and vocational subjects.

GE Pensions Total $2,499,893 for One Year

■ Pension payments to 3214 retired General Electric Co. employes amounted to $2,499,893 in 1937.

The pension trust assets Dec. 31 were $41,197,153, from amounts paid in by the company. The assets of the "additional pension trust," from savings paid in by employes, were $11,035,388 on that date.

Since 1912, when the pension plan was inaugurated, $20,747,887 has been paid to retired employes.

Prof. Stoughton and Mr. Schwartz Explain Scrap Situation to Senators

■ ARGUMENTS for and against bills pending in congress to restrict iron and steel exports, except under government license, were heard in Washington last week by a subcommittee of the senate's committee on military affairs. The committee has taken the matter under advisement.

Former Governor Louis J. Brann of Maine, representing the independent steel and iron producers' committee, called as his witness Prof. Bradley Stoughton, dean of the College of Engineering, Lehigh university.

Benjamin Schwartz was present in behalf of the Institute of Scrap Iron and Steel Inc., of which he is director general. Other witnesses were: Charles M. Haskins, secretary, National Association of Scrap Iron and Steel Inc., New York; Dr. Jacques Maguit, New York; Leonard J. Ganse, representing the Warm Air Furnace Manufacturers institute, Washington; and John Calandrillo, president, Waste Materials Sorters, Trimmers and Handlers union, Brooklyn, N. Y.

Professor Stoughton was the first witness and made a comprehensive statement, illustrated with charts, favoring the proposed license law.

He suggested the military affairs committee recommend that all scrap export licenses should be issued for not more than 20 per cent of prime grades of scrap, the balance to be made up of No. 2 heavy melting, busheling, cast iron and other grades which would meet foreign requirements. Such limitation on exports of prime grades would satisfy the independent steel producers committee, he said.

Sees Threat to U. S. Manufacturing

Arguments for the bill included the continued prosperity of the country and the iron and steel industry, with consequent extensive employment of skilled and semiskilled labor. Professor Stoughton added that iron and steel scrap is an essential raw material, and is being exported at a ruinous rate. Raw material exports permit foreign countries to take manufacturing away from the United States, where wage rates are much higher.

"We are not asking," he continued, "an absolute embargo. All we desire is reasonable limitation which will permit exportation without detriment to American industries and the American worker.

"Our committee agrees a certain percentage of prime scrap is required by foreign countries, and should be made available to them. We further believe that the percentage of these grades available for export shipment should be kept at a minimum, and the maximum for foreign nations should be supplied from our lower grades, which those countries can readily use, and which are not nearly so desirable for domestic use as the prime grades."

Mr. Schwartz told the committee there is no justification for any group of manufacturers during peace times to seek relief from congress from fluctuating raw material costs.

He contended maintenance and encouragement of free and open scrap markets without legislative or artificial restraints are vital to national defense.

"There is no shortage of scrap at the present time or apparent shortage for the next generation . . . Scrap exports are not depriving the steel industry of vital raw materials nor are they injurious to their best interests."

Concerning employment, he declared restriction would throw on relief at least 100,000 of the 250,000 persons now engaged in the industry, and substantially affect revenues of railroads, stevedores, longshoremen, port authorities and equipment companies.

It would force onto the domestic market several million tons of "distress" scrap, causing a collapse in prices.

"Any contention that scrap exports are the cause of increased cost to the steel companies, requiring them to maintain certain levels of steel prices and compelling them to pass on the cost to the ultimate consumer cannot be substantiated," he continued.

Denies Scrap Shortage

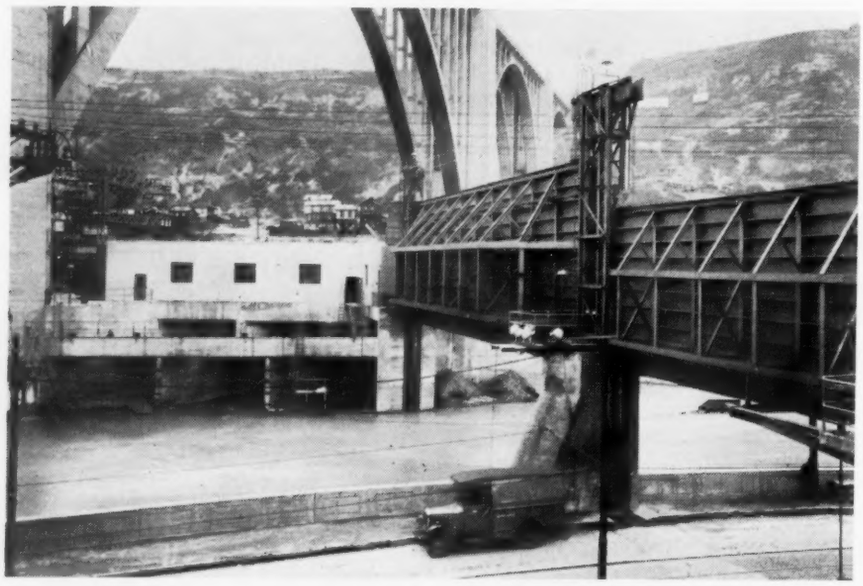
"The national defense arguments directed against scrap apply with equal force to pig iron and to the various forms of finished steel exported from this country, which are used essentially for the same purposes as scrap.

"The history of this country demonstrates conclusively that the scrap industry has brought out all the scrap required in the United States in all emergencies, whether war or peace."

Calandrillo read into the record a resolution against the bill's passage adopted by his union. "We are unalterably opposed to any legislation restricting the export of scrap," he testified.

Mr. Haskins also opposed the bill: "It is my belief, based on over 35 years of intimate contact with the

Massive Steel Gates in "Upside-Down" Dam



■ **When floods threaten the industrial district along Turtle creek, a few miles east of Pittsburgh, these two massive steel gates will be let down—one across Turtle creek, the other across Braddock avenue. First, the down-flooding water in the creek will be walled in; and the water backing up from the Monongahela river through this valley will be walled out. Water accumulating in Turtle creek, because of the interrupted flow, will be by-passed around the dam, through the pumping station shown in the photo. The dam, built by Westinghouse Electric & Mfg. Co. engineers, cost $500,000 and was tested recently**

waste material industry, that irrespective of how large exports become, there will remain in this country sufficient tonnages of scrap iron and other waste material commodities to take care of domestic requirements."

Dr. Maguit, who did not disclose his business connection, saying he appeared for himself, also argued against the bill. He is reported to have some contact with scrap exports to China.

If exports are to be limited, he said, finished steel shipments also should be restricted.

Mr. Ganse, for the furnace institute, argued in favor of the bill, defended its constitutionality.

First Quarter Ingots Lowest Since 1934

■ PRODUCTION of open hearth and bessemer ingots in March totaled 2,011,840 gross tons, 33.84 per cent of capacity, an increase of 18 per cent in tonnage over the February output, which was 1,703,245 tons, at 31.73 per cent of capacity, according to the American Iron and Steel institute. The March total was 61 per cent below the output in March, 1937, 5,216,243 tons. The operating rate in that month was 89.9 per cent.

Weekly production in March was 454,140 tons, compared with 425,811 tons in February, and 1,177,481 tons in March, 1937.

First quarter production was 5,447,351 tons, equivalent to 31.57 per cent of capacity. This was the lowest for any three-month period since the final quarter of 1934 when production totaled 5,056,784 tons. Output in the quarter was 22 per cent less than in the last three months of 1937, and 62 per cent less than in the first quarter of 1937.

GERMAN INGOT OUTPUT TOPS U. S. FOR JANUARY

For the first time, German steel ingot production for January passed that of the United States, according to the Reich statistical office. Figures show Germany produced 1,812,000 tons, United States 1,732,266 tons.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended April 9	Change	Same week 1937	Same week 1936
Pittsburgh ..	29	— 3	95	57
Chicago	31	— 1.5	84	68
Eastern Pa...	28	— 1	59.5	42
Youngstown..	33	+ 3	87	76
Wheeling	33	— 8	96	76
Cleveland ...	27	— 6.5	74	86
Buffalo	28	— 2	88	62
Birmingham..	66	None	80	69
New England.	20	None	95	78
Cincinnati ...	45	+27	90	76
St. Louis.....	42.4	— 4.1	82	†
Detroit	18	None	100	100
Average....	32	— 4	91.5	66.5

†Not reported.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.29 per cent in 1936

1938	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	— Total — Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.	1,632,275	30.24	99,991	18.27	1,732,266	29.14	391,031	4.43
Feb.	1,577.752	32.37	125,493	25.40	1,703,245	31.73	425,811	4.00
March.....	1,854,103	34.35	157,737	28.83	2,011,840	33.84	454,140	4.43
3 mos.....	5,064,130	32.32	383,221	24.13	5,447,351	31.57	423,589	12.86
1937								
Jan.	4,433,145	84.20	291,749	54.29	4,724,894	81.43	1,066,567	4.43
Feb.	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
March ...	4,812,879	91.42	403,364	75.06	5,216,243	89.90	1,177,481	4.43
3 mos.....	13,328,187	87.21	1,026,782	65.82	14,354,969	85.23	1,116,250	12.86
April	4,681,677	91.83	388,768	74.70	5,070,445	90.24	1,181,922	4.29
May	4,767,269	90.55	382,582	71.19	5,149,851	88.76	1,162,495	4.43
June	3,899,190	76.48	284,572	54.68	4,183,762	74.46	975,236	4.29
July	4,220,561	80.09	335,440	62.56	4,556,001	78.48	1,030,769	4.42
Aug.	4,502,243	85.25	373,428	69.49	4,875,671	83.79	1,100,603	4.43
Sept.	4,029,921	78.98	268,433	51.70	4,298,354	76.46	1,004,288	4.28
Oct.	3,203,447	60.66	189,244	35.22	3,392,691	58.31	765,844	4.43
Nov.	2,040,020	39.89	113,761	21.86	2,153,781	38.22	502,047	4.29
Dec.	1,385,406	26.29	86,835	16.20	1,472,241	25.36	333,086	4.42
Total	46,057,921	74.21	3,449,845	54.54	49,507,766	72.39	949,516	52.14

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots, total 1,341,856 gross tons; based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons; bessemer, 6,325,000 gross tons.

PRODUCTION

■ CURTAILMENT of operations at practically all important centers caused a drop of 4 points in the national operating rate, to 32 per cent last week. Some increases are scheduled for this week.

Youngstown, O.—Advanced 3 points to 33 per cent, with 31 open hearths and three bessemers active. This week the rate probably will drop to 30 per cent as three open hearths are scheduled to be dropped.

Cleveland—Down 6.5 points to 27 per cent, one producer operating its active furnaces only half the week.

Cincinnati—Up 27 points to 45 per cent, to care for accumulated orders.

Central eastern seaboard—Lost 1 point to 28 per cent on curtailment by one mill. Carnegie-Illinois Steel Corp. announces operations at its Pencoyd works, Philadelphia, are being discontinued temporarily.

New England—Held at 20 per cent, with an increase of about 10 points scheduled this week. American Steel & Wire Co. will resume steelmaking at its Worcester, Mass., plant April 11, with about 25 per cent capacity engaged. Open hearths at this plant have been down since Feb. 26 although other divisions of this plant have been operating.

Birmingham, Ala.—Unchanged at 66 per cent, with expectation of the same rate this week.

Detroit—With four furnaces in production the rate is unchanged at 18 per cent.

Pittsburgh—Reduction of 3 points to 29 per cent resulted from curtailment by large producers, although some smaller interests have increased operations.

Wheeling—Off 8 points to 33 per cent, considerable curtailment being announced by several mills.

Chicago—Declined 1.5 per cent to 31 per cent.

St. Louis—Off 4.1 points to 42.4 per cent, with further loss probable this week.

Buffalo—Reduced 2 points to 28 per cent.

Auto Production Up

■ Automobile production for the week ended April 9 totaled 60,975 cars, 3475 units more than in the preceding week, according to Ward's Reports. Comparisons:

	Week ended April 9	April 2
General Motors	22,430	*20,530
Chrysler	14,075	14,575
Ford	15,885	14,385
All others	8,585	8,010

*Revised.

Monthly and yearly comparisons will be found on page 36.

MEN OF INDUSTRY

■ BERTRAM S. STEPHENSON, vice president, Tonawanda Iron Corp., North Tonawanda, N. Y., has been elected president. He succeeds Clarence M. Woolley, chairman, American Radiator & Standard Sanitary Corp., of which the Tonawanda corporation is a subsidiary. Mr. Stephenson at one time was associate editor of *Iron Trade Review*, now STEEL, at New York. He joined M. A. Hanna & Co., Cleveland, in 1910, and his first assignment for that organization was with the Detroit Iron & Steel Co., a Hanna interest. Subsequently he was in charge of Hanna's Pittsburgh offices, and he also opened the company's Cincinnati pig iron sales offices.

♦

H. L. Rogers, a director of Belden Mfg. Co., Chicago, has been elected vice president of the company.

♦

Burns Dreese, manager of the Dayton, O., scales division, Hobart Mfg. Co., Troy, O., has been made assistant general manager. Edward Berchtold has been named assistant to the president.

♦

Max W. Babb, president, Allis-Chalmers Mfg. Co., Milwaukee, has been elected a director of Cutler-Hammer Inc., Milwaukee, to succeed T. Johnson Ward, Philadelphia, who has retired.

♦

R. K. Mangan has been named vice president in charge of advertising, and domestic and export sales of diesel and gasoline engines, Buda Co., Chicago. He has been affiliated with Buda 20 years.

♦

C. C. Conway and O. C. Huffman have been re-elected chairman of the board and president, respectively, Continental Can Co. Inc., New York. All other officers have been re-elected.

♦

H. S. Strouse has been appointed vice president, Harnischfeger Corp., Milwaukee. He joined the company about 18 years ago as an estimating engineer, and subsequently has served in the capacities of advertising manager, treasurer, and a director.

♦

A. C. Howard, since 1932 assistant general manager of Fairbanks, Morse & Co.'s main works at Beloit, Wis., has been appointed general manager of the plant, and Charles H. Morse III, has been named assistant general manager. A. E. Ashcraft, vice president in charge of manufacturing, who has been in charge at Beloit, will attend to executive duties throughout all factories of the Fairbanks-Morse organization in this country and Canada.

John B. DeWolf

Formerly assistant manager of tin plate sales, Republic Steel Corp., Cleveland, who has been named district sales manager in Philadelphia for Jones & Laughlin Steel Corp., as reported in STEEL, April 4, page 30

♦

Noble Jones, formerly with Allegheny Steel Co., Brackenridge, Pa., has been elected vice president in charge of operations and a director, Barium Stainless Steel Corp., Canton, O. Other officers and directors have been re-elected, with the exception of J. B. Root.

♦

K. P. Fuhrmann has been appointed manager of the newly created barrel and range division, Wheeling Steel Corp., with offices at Portsmouth, O. Steel barrels which have been produced at the Portsmouth works for a number of years were formerly sold by the Wheeling Corrugating Co., which will continue to handle the sale of small containers at the general offices in Wheeling, W. Va.

V. A. Jevon

Who is in charge of the new district sales office in Baltimore for Jones & Laughlin Steel Corp., as noted in STEEL, April 4, page 30. He formerly was associated with Bethlehem Steel Co.

♦

Charles J. Maher, since 1921 superintendent of the Filbert mine, H. C. Frick Coke Co., has been appointed assistant general superintendent, with headquarters at Uniontown, Pa. He succeeds W. C. Hood, now general superintendent, United States Coal & Coke Co.

♦

Fred W. Deppe has joined the sales organization of Youngstown Sheet & Tube Co., with headquarters at St. Louis. He formerly was manager of sales for Reading Iron Co. at New York and Philadelphia, and more recently district sales manager for the company at St. Louis.

♦

William P. MacDonald has been appointed district sales manager of New York territory by Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y. He will be assisted by C. F. Hutchings and L. W. Kunzmann, with offices at 117 Liberty street, New York. Mr. MacDonald was identified with the engineering and estimating departments from 1909 to 1929 when he was transferred to the sales department as sales engineer.

♦

John Stephens, associated with United States Steel Corp. subsidiaries since 1934, when he started as a sales student at the former Illinois Steel Co.'s plants in Gary and South Chicago, has been appointed director of industrial relations, United States Steel Corp. of Delaware. When the Carnegie and Illinois Steel companies were merged, Mr. Stephens became manager of industrial relations, Chicago district, which position he held until his present appointment.

♦

David O. Thomas, general manager, Saginaw Malleable Iron division of General Motors Corp., Saginaw, Mich., has been appointed vice president, Bendix Aviation Corp., South Bend, Ind., a General Motors affiliate. W. H. Doerfner, works manager, Saginaw Malleable Iron division, succeeds Mr. Thomas as general manager. James H. Smith succeeds Mr. Doerfner as works manager. Edward R. Palmer, assistant comptroller of General Motors, has been elected a vice president of Bendix Aviation.

♦

Douglas F. Miner, manager, central engineering laboratories and standards, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed George Westinghouse professor of engineering, Carnegie Institute of Technology, effective Sept. 1. He will act as

co-ordinator for the Westinghouse co-operative engineering plan, under which a qualified group of engineering students at Carnegie Tech will take the usual technical college courses and during the same period receive shop and engineering experience at the Westinghouse plant.

♦

E. A. Hoffman, since 1927 associated with the sales department of American Steel & Wire Co. at Chicago, has been elected president, Chicago Junior Association of Commerce. He was vice president in charge of the commerce and industry division last year and this year has served as vice president of the civic affairs division.

♦

Hugh E. Brown, director of research, W. S. Tyler Co., was elected chairman, Cleveland chapter, American Society for Metals, at the chapter's monthly meeting, April 4. Harry D. Churchill, associate professor of mechanics, Case School of Applied Science, was named vice chairman. Louis W. Kempf, research metallurgist, Aluminum Co. of America, was elected treasurer; and

Edward H. Hughes
Who is Jones & Laughlin Steel Corp.'s new district sales manager at St. Louis. His appointment was announced in STEEL, April 4, page 30

Lewis F. Herron, metallurgist, James H. Herron Co., was chosen secretary.

The following were made members of the executive committee: Retiring chairman G. T. Williams, metallurgist, Cleveland Tractor Co.; C. R. Augden, metallurgist and foreman, B. F. Goodrich Co., Akron, O.; W. T. Cramer, plant metallurgist, American Steel & Wire Co.; D. C. Fabel, head, mechanical engineering department, Fenn college; G. J. Hales, sales engineer, Cleveland Electric Illuminating Co.; H. L. Hopkins, metallurgist, National Screw & Mfg. Co.; C. L. Johnson, chief chemist and technical superintendent, Franklin Oil & Gas Co., Bedford, O.; J. W. Morrison, metallurgical engineer, Cleveland Wire Spring Co.; A. E. R. Peterka, technical assistant to vice president, Lamson & Sessions Co.; E. C. Smith, chief metallurgist, Republic Steel Corp.; and M. A. Tran, metallurgist, Park Drop Forge Co.

Frederick A. Westphal
Superintendent of wire mills, Sheffield Steel Corp., Kansas City, Mo., who has been elected president of The Wire association, New York, as noted in STEEL, March 28, page 25

DIED:

■ PATRICK J. MORAN, 61, vice president, Hanna Furnace Corp., in charge of the corporation's Susquehanna blast furnace at Buffalo, April 3 in Miami, Fla., of pneumonia. At the age of 22 he was employed at the Hannah furnace, Youngstown, O., of the Mahoning Valley Iron Co., which was absorbed by Republic Iron & Steel Co. Subsequently he joined United Iron & Steel Co., with stacks at Leetonia, O., and West Middlesex, Pa., and when these stacks were taken over by M. A. Hanna & Co. he was placed in charge of both furnaces. Later he was transferred to Detroit Iron & Steel Co., another Hanna interest, and when the Hanna Furnace Co. was formed he was put in charge of both Detroit and Buffalo furnaces. He was made vice president and general manager at Buffalo when National Steel Corp. took over the Hanna properties.

♦

James M. Clem, 72, vice president and a director, Ohio Forge & Machine Co., Cleveland, in that city, April 4.

♦

Frederick Thomas Moore, 62, first vice president, Colt's Patent Firearms Co., Hartford, Conn., in that city, March 31.

♦

Lawrence K. Slaback, 56, manager of sales, Cincinnati district, for Carnegie-Illinois Steel Corp., and Tennessee Coal, Iron & Railroad Co., March 29 at West Palm Beach, Fla. He was associated with United States Steel Corp. subsidiaries at Cincinnati for more than 37 years.

♦

James K. Chalmers, 76, president, Saw & Specialty Co., Detroit, at St. Petersburg, Fla., March 26. He entered the saw business in 1910, and since 1918 has been president of Saw & Specialty Co.

♦

Otto J. Groehn, 49, active in engineering work for two decades with Briscoe Mfg. Co., Clayton & Lambert Mfg. Co., and Hudson Motor Car Co., Detroit, in that city, March 23.

♦

William Werner Trimpi, 78, president, Newark Rivet Works, Newark, N. J., in Okahumpka, Fla., March 26. Born in Newark, Mr. Trimpi founded the rivet company 50 years ago.

♦

George Canning, 74, former president, George Canning & Co., Cleveland, iron and steel brokerage firm, and former secretary, Cleveland City Forge & Iron Co., March 31 in Fort Worth, Tex., where he recently made his home.

♦

Harlow F. Wilson, secretary and auditor, Columbia Steel Co., San Francisco, from 1930 until his retirement last year, in Pasadena, Calif., March 18. Mr. Wilson spent 48 years of active service with United States Steel Corp. subsidiaries.

♦

Gilbert D. Boyd, 52, vice president, Wallingford Steel Co., Wallingford, Conn., in that city, March 29. Prior to helping organize the Wallingford company in 1922, Mr. Boyd was associated with Reed & Prince Mfg. Co., American Steel & Wire Co., and American Tube & Stamping Co.

♦

Thomas H. McKenney, 70, manager of welfare, Carnegie-Illinois Steel Corp., Chicago, prior to his retirement in April, 1936, in that city, March 29. He served continuously with the company since 1892, and was supervisor of labor and safety for 19 years.

♦

Charles F. Prettie, 73, superintendent of erection, Canadian Bridge Co. Ltd. for 25 years, and prior to that erector for the American Bridge Co., in St. Petersburg, Fla., March 29. While with Canadian Bridge, he had charge of erection of many of the largest railway and highway bridges in the Dominion.

♦

Frank G. Tallman, 78, vice president and director, E. I. du Pont de Nemours Co., Wilmington, Del., April 1. Early in his career he was associated with the steel mills of Carnegie, Phipps & Co., Beaver Falls, Pa., as general superintendent. Subsequently he joined du Pont as director of purchases.

Details of 1937 Pig Iron Output

■ PIG IRON production in 1937 totaled 36,129,596 gross tons, an increase of 5,913,049 tons, or 19.5 per cent, over the 30,216,547 tons in 1936, according to the American Iron and Steel institute.

Pennsylvania retained its position as largest producer, with 11,371,238 tons, Ohio being second with 7,903,944 tons. The Indiana-Michigan district was third with 4,722,316 tons, and Illinois fourth with 3,426,116 tons.

Ferroalloy production totaled 997,681 tons, compared with 812,640 tons in 1936, an increase of 185,041 tons, or 22.7 per cent. The output consisted of 515,781 tons of ferromanganese and spiegeleisen, 412,432 tons of ferrosilicon, and 69,468 tons of other alloys.

Basic pig iron production amounted to 24,780,789 tons; bessemer and low-phosphorus 6,315,382 tons; foundry 2,826,238 tons; malleable 2,115,106 tons; forge mill 22,399 tons; white and mottled, direct castings, etc., 69,682 tons.

Of the total, 29,624,407 tons, or 82.1 per cent was for the makers' own use, and 6,505,189 tons, or 17.9 per cent, for sale. In 1936 makers used 83 per cent, and in 1935, 82 per cent. In 1913 only 69.2 per cent of the output was used by the makers.

PRODUCTION OF PIG IRON AND FERROALLOYS
(All Figures Are Gross Tons)

Pig Iron	1933	1934	1935	1936	1937
Pennsylvania	3,728,839	4,244,566	5,479,792	9,102,875	11,371,238
Ohio	3,918,723	4,207,944	5,634,530	7,206,655	7,903,944
Indiana, Michigan	1,469,783	2,184,546	2,898,478	4,168,299	4,722,316
Illinois	1,012,676	1,269,154	2,003,388	2,917,016	3,426,116
Alabama	900,170	1,171,650	1,297,960	1,998,212	2,580,674
Massachusetts, New York	665,928	1,053,257	1,415,755	2,220,522	2,843,286
Md., Va., West Va., Ky., Tenn.	1,143,600	1,318,964	1,781,171	2,102,106	2,531,457
Minn., Iowa, Colo., Utah	161,000	226,808	269,686	500,862	750,565
Total	13,000,719	15,676,889	20,780,760	30,216,547	36,129,596
Ferroalloys					
Pennsylvania	163,798	164,776	219,947	330,463	437,315
New York, New Jersey	98,857	140,711	195,281	243,176	259,583
Ohio, Iowa, Colorado	63,386	116,402	113,147	164,173	172,379
Va., West Va., Ala., Tenn.	18,842	39,795	63,564	74,828	128,404
Total	344,883	461,684	591,939	812,640	997,681
Grand total	13,345,602	16,138,573	21,372,699	31,029,187	37,127,277

PIG IRON MADE FOR SALE IN 1937

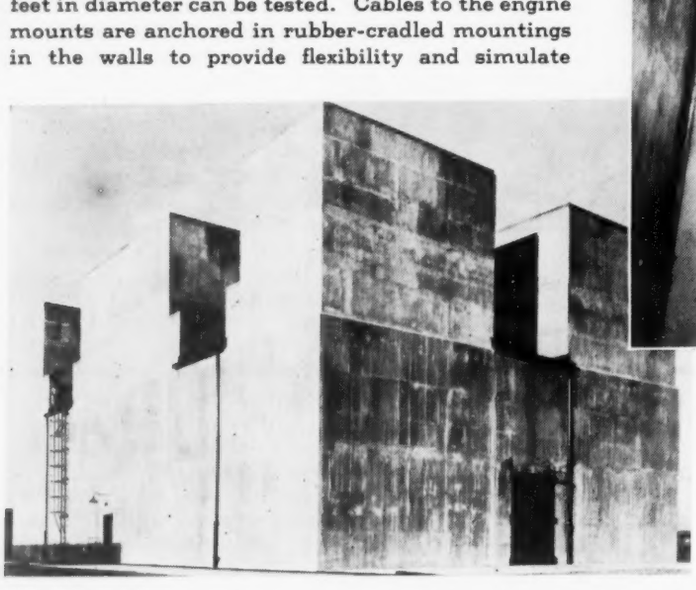
States	Basic	Bess and low phos.	Foundry	All other	Total
Massachusetts, New York	173,838	86,927	531,979	280,146	1,072,890
Pennsylvania	721,833	335,153	312,693	123,710	1,493,389
Md., W. Va., Ky., Ala., Tenn.	124,502	9,876	1,143,050	35,498	1,312,926
Ohio	324,689	22,087	221,576	717,290	1,285,642
Indiana, Illinois	305,460	21,152	136,990	662,791	1,126,393
Mich., Minn., Iowa, Colo., Utah	38,986	.....	110,413	64,550	213,949
Total	1,689,308	475,195	2,456,701	1,883,985	6,505,189

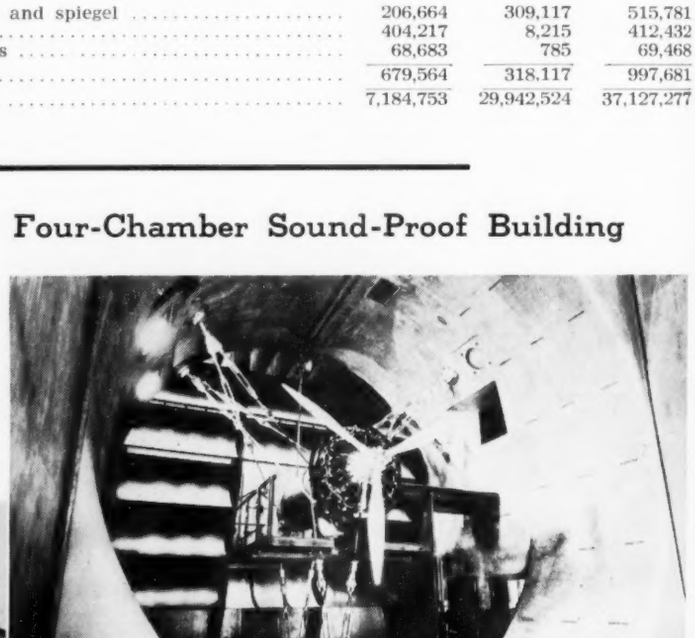
PRODUCTION OF PIG IRON AND FERROALLOYS IN 1937
(For sale and for maker's use)

Pig Iron	For sale	For maker's use	Total
Basic	1,689,308	23,091,481	24,780,789
Bessemer and low phosphorus	475,195	5,840,187	6,315,382
Foundry	2,456,701	369,537	2,826,238
Malleable	1,825,007	290,099	2,115,106
Forge or mill	21,926	473	22,399
White and mottled, direct castings, etc.	37,052	32,630	69,682
Total	6,505,189	29,624,407	36,129,596
Ferroalloys			
Ferromanganese and spiegel	206,664	309,117	515,781
Ferrosilicon	404,217	8,215	412,432
Other ferroalloys	68,683	785	69,468
Total	679,564	318,117	997,681
Grand total	7,184,753	29,942,524	37,127,277

Airplane Engines Tested in New Four-Chamber Sound-Proof Building

■ **New test house for aircraft engines recently completed at East Hartford, Conn., by Pratt & Whitney Aircraft Corp. is shown below. At the right is one of the four large chambers in which engines up to 3000 horsepower and propellers 23 feet in diameter can be tested. Cables to the engine mounts are anchored in rubber-cradled mountings in the walls to provide flexibility and simulate actual flight conditions. The test chambers embody the combined suggestion on soundproofing of Pratt & Whitney engineers, sound engineers of the federal government, and the acoustical department of Albert Kahn Inc., Detroit, architect for the structure. Sound deadening is aided by thick windowless concrete walls**





Activities of Steel Users, Makers

■ GISHOLT Machine Co., Madison, Wis., has made the following territorial and personnel changes in its direct sales representation. The company's eastern office at 1060 Broad street, Newark, N. J., charge of R. D. Heflin and R. H. Bruce will embrace eastern New York, eastern Pennsylvania, and New Jersey, Delaware and Maryland. Western New York, including Syracuse, Rochester and Buffalo areas, will be in charge of Glenn M. Rogers, 7 Maple street, Pittsford, N. Y. D. A. Walters, formerly of the Ohio territory, has been transferred to the Detroit office. Indiana, south of and including Muncie, will be covered by the Dayton O., office, in charge of E. B. Verner. Harold Earl, formerly of the Gisholt service staff, has been transferred to the Chicago sales office and will cover western Illinois, Iowa and the St. Louis district.

♦

American Steel Export Co., New York, has established executive offices at 347 Madison avenue.

♦

Republic Steel Corp., Cleveland, has appointed W. B. Young Supply Co., Kansas City, Mo., as jobber for its tubular products.

♦

Columbia Machine Tool Co., Hamilton, O., has purchased all records, drawings, blue prints and patterns of Long & Allstatter Co., Hamilton.

♦

American Car & Foundry Co., New York, has moved its St. Louis office from 1558 South Vandeventer avenue to 705 Olive Street building. Offices of J. G. Brill Co., a subsidiary, have also been moved to the new location.

♦

Steel and tube division of Timken Roller Bearing Co., Canton, O., has appointed Joseph T. Ryerson & Son Inc. to warehouse Timken mechanical tubing (S.A.E. 1015 steel) in territories served by Boston, Jersey City, N. J., Philadelphia, Buffalo, Cincinnati, Chicago, St. Louis, Cleveland, Detroit and Milwaukee.

♦

Sivyer Steel Casting Co., Milwaukee, is installing a new type sand blasting machine manufactured by the American Foundry Equipment Co., to reduce handling costs and increase production, as part of a general plant improvement program. The unit weighs 12 tons and takes castings up to 40 inches in diameter.

♦

Harnischfeger Corp., Milwaukee, has been awarded an $85,000 contract for furnishing the government a 300-ton electric traveling crane for the Guntersville dam project of the TVA. The company also recently booked an order from the Ford Motor Co. for seven cranes of various sizes for new die shops.

♦

Link-Belt Co., Chicago, has completed a 20 x 288 foot extension to its plant in Atlanta, Ga. In recent months the Atlanta plant has been substantially enlarged to provide for a larger engineering department, more shipping space and additional area for stocks of elevating, conveying and power transmitting machinery.

♦

Heil Co., Milwaukee, manufacturing a wide variety of industrial, commercial and domestic equipment, is expanding its line of brewery machinery by the addition of large pasteurizing machines of the automatic type. Capacities will range from 5 to 25 barrels an hour. A. Ladewig, pioneer engineer of pasteurizing equipment, has joined the company as general manager of the new department.

♦

Electrol Inc., Clifton, N. J., automatic oil heating and air conditioning equipment, has completed negotiations for purchase of plant, factory buildings and land which it has leased for several years. The company is now operating on full schedule and production is about 35 per cent ahead of that a year ago. It is adding two new lines associated with oil burners, the first of which will be announced shortly.

♦

Assets and operations of J. A. Fay & Egan Co., (Oakley) Cincinnati, O., builders of woodworking machinery, have been taken over by a new Ohio corporation of the same name. The former company was a West Virginia corporation. From Jan. 5, 1937, to March 5 this year the business was conducted by trustees appointed by federal court, which early this year approved a reorganization plan.

♦

Coulter-Sibbett Steel Co., 248 Eighth street, Oakland, Calif., has been formed to distribute alloy and tool steels in Oakland and surrounding districts, by A. J. Coulter and George E. Sibbett. Mr. Coulter for the past ten years had been manager of Earle M. Jorgenson Co., Los Angeles, and prior to that was connected with the San Francisco office of Midvale Co. Mr. Sibbett for the past 11 years was vice president and general manager, Pacific

(*Please Turn to Page* 107)

Norton Co. Honors Its Chairman, C. L. Allen, at 80

■ To commemorate the eighth birthday of its chairman, Charles Lucius Allen, Norton Co., Worcester, Mass., has struck a bronze medal. Obverse has a likeness of Mr. Allen

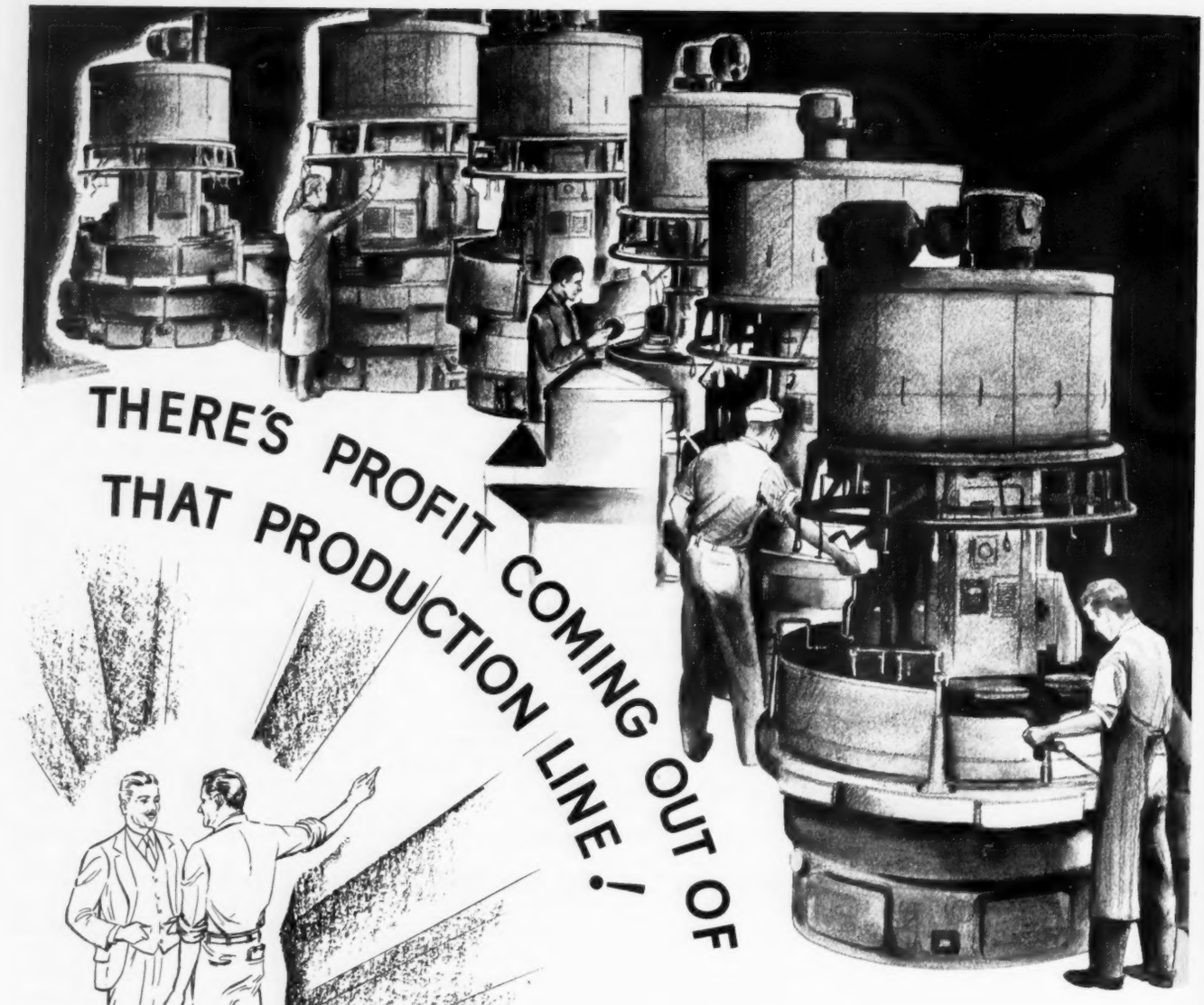
and is inscribed "Commemorating Four Score Years as Pioneer, Leader, Counselor, Friend." On the reverse is inscribed Mr. Allen's record with the company.

Mr. Allen first was associated with F. B. Norton, who in 1873 invented and began to manufacture the first Norton emery wheel. When the Norton Co. was formed in 1885, Mr. Allen became its general manager. In 1892 he was elected a director; became secretary in 1892, treasurer in 1912, president in 1919 and chairman in 1933.

"It would have been a great joy to us all to have given him a big birthday celebration," says an editorial in the company's magazine. "But he begged to be let off from a party, and we finally decided that at 80 a man should be allowed to have his own way for once."

Associates sent greetings, and the *Norton Spirit* reprinted his favorite photograph.

Wrote Aldus C. Higgins, president: "We have prepared this souvenir in thankfulness not only for what Mr. Allen has been to us in the past but because he is still active in our councils, still animated by a spirit of youthful endeavor, still gifted with a vision that looks for better things in the future, still directed by a sterling character standing for high ideals in business and human relations, and still with a warm heart of generous feeling and fine sentiment."



THERE'S PROFIT COMING OUT OF THAT PRODUCTION LINE!

Today, with new economic problems cropping up, it is more than ever necessary to obtain every lick of Profit from every job and every production line.

Replacement with Mult-Au-Matics to suit your jobs will assure the utmost in dollars and cents return on your machinery.

Many Mult-Au-Matic users have remarked, "There's Profit coming out of that production line." What these machines can do for them, they can also do for you.

Ask Bullard Engineers to figure your jobs the Mult-Au-Matic way. You'll be assured of the Savings you'd probably like to have right now.

THE BULLARD COMPANY

BRIDGEPORT, CONNECTICUT

MIRRORS OF MOTORDOM

DETROIT

■ FIRST indication of the advent of spring in the automobile industry appeared last week when the long-awaited upturn in production became a reality. Thus far this year assemblies have crossed the 60,000 mark for only two weeks—in January—but last week they again surged above this level and gave indication of continuing the ascent in mild form, possibly until the end of May.

Gradual working down of field stocks, which have been unusually heavy, is paving the way to better plant operations here, although current activity is still a long way from the 100,000-car weeks the industry was achieving last year at this time. Improved assembly schedules are the order of the day with nearly all producers, particularly Plymouth and Dodge.

Ford is moving back to higher levels, after giving dealers an opportunity to digest heavy output of January and February. Of the General Motors divisions, Buick continues to make relatively the best showing, having returned to a five-day week. Oldsmobile, after being practically at a standstill for more than a week, has resumed on a short week for the time being, assembly lines being cut back during the shutdown for more efficient operation at the current restricted level.

Chevrolet is holding fairly close to 16,000 assemblies weekly from its scattered assembly plants, most of them being on two and three-day weekly schedules. Pontiac likewise holds to a reduced output, ranging around 1400 units weekly, compared with 4300 at the same time last year.

Cadillac reports improvement in dealer requisitions has put more unfilled orders on the books than were on hand a month ago, with the result plant operations have been adjusted slightly upward to a level of about 500 jobs per week.

Plymouth assemblies resumed on a 5-day basis last week for the first time since November last year, and the plant is now working one shift 40 hours per week. With output approximating 8000 cars weekly, a continuance of this rate is dependent entirely on ability of dealers to move cars into the public's hands; under present conditions there is undoubtedly some stocking of this output.

BY A. H. ALLEN
Detroit Editor, STEEL

Expected labor trouble at the Plymouth plant failed to develop, possibly as a result of the management's anticipation of a so-called "stop work" strike and posting of notices regarding it. The difficulty is said to have arisen following the revision of the work week from 32 to 40 hours and the indicated refusal of certain UAW employes to work the additional hours because of their desire to see additional men hired.

Labor Outlook Improved

However, with the UAW making an eleventh-hour capitulation to the Chrysler proposal to extend its contract unchanged for another year, the chances of any immediate uprisings are slimmer. The various Chrysler locals have been voting on ratification of the agreement, and the votes have been favorable.

With Plymouth production accelerating, Briggs likewise has raised work schedules to five days, one shift, and a partial night shift has been working at intervals on the new two-door trunk sedan model recently added to the Plymouth standard or Roadking series.

Coincident with the introduction of the Roadking series has come a general refurnishing of interiors on all Plymouth models. Garnish moldings are being given a lighter grained finish, dual sun visors are being installed, and bright metal trim is being applied around windshields, supplanting a painted trim.

Arm rests on doors are being added to certain models, and better grades of upholstery and sewing are being adopted. A new buffer strip is being applied to the top of front seats in sedan models. Interior hardware is also being refined and improved.

■ LOOKING behind the scenes in UAW activities, the motivating force these days is anything to whip dues-payers back into the fold. Thousands who until recently have regularly dumped their dollar bills into the union treasury every month have been forced by economic circumstances to abandon these payments, and the UAW necessarily has not been too tough about these laggards. But when Briggs, for one, dispensed with one shift and put the other shift on full time, the UAW agreed because it foresaw an immediate return to the ranks of dues-payers of these thousands going back on full time. Such was not the case, however, and the UAW has been forced to send its "flying squads" to the Briggs plant for "button checks."

This technique, used many times previously, consists in having a squad of burly business agents stationed at the employes' gate of the plant to stop every man entering and ask to see his union button. Different colored buttons are issued each month and it is a simple matter to determine whether a man is paid up on his dues by checking buttons.

Hundreds were found to have defaulted in their dues, and the standard warning to "pay up or else" was issued. In some cases, it is reported men were even refused admission to the plant by union organizers unless they paid their dues on the spot, and in more than one instance men so stopped were said to have returned home rather than

pay out their hard-earned cash.

An interesting method of arming union pickets was on display at the recent disturbance here around the plant of Federal Screw Works. A city ordinance or police regulation forbids pickets from carrying any weapons or missiles in a picket line, but, of course, does not forbid the carrying of signs.

So ingenious pickets simply tacked signs and placards to arm-length pieces of 2 by 4, and it was a simple matter to tear off the sign and throw the timber at an officer or a worker trying to approach the plant.

It is such practice that puts the stamp of absurdity on UAW charges of "police brutality" in connection with encounters between police and pickets. Such charges are made solely for publication in newspapers and for edification of "civil liberties committees" and the like.

■ ONE division of the Briggs body plant is busy on initial work for the three lines of cars to be introduced by Ford for 1939. Some quarter panels already have been turned out for preliminary assemblies. Best opinion is that Ford will have three wheelbases for next year, each with a different horsepower motor, and possibly using the unit-type or chassis-less frame on at least one of the three series.

Stored somewhere in the Briggs plant are 40,000-odd sets of stainless steel belt-line moldings originally produced for installation on a revised Plymouth design early this year. To use up this stock of parts, it is likely such moldings will be worked into Plymouth body designs for next year. It would be a costly matter to scrap all this stainless steel and to write off the tools and time required to fabricate them.

Buick is installing a battery of large Clearing fender presses, each equipped with the new "curtain of light" photoelectric control which prevents operation of the press as long as beams of light between upper and lower dies are interrupted.

As soon as the operator places a sheet of steel in the dies and removes his hands, the press starts to operate automatically. In addition to being a practically foolproof safety feature, the system actually speeds up production, and the complete photoelectric cell and control installation may cost as little as $1200.

■ DESPITE encouraging aspects of production in the past week or two, it is a bleak year for materials and parts suppliers for the automotive industry. It is doubtful whether releases for 1938 models will anywhere near approach earlier commitments, and further commitments appear out of the question. Steel buying is in the same category. When purchases were made last year, they were based on production figures probably 70 to 100 per cent in excess of what is being achieved.

Take the case of one manufacturer in the medium price field who bought steel last fall for 115,000 cars. Seven months of production on 1938 models has totaled about 73,400 cars and the rate now is about 5500 monthly.

With only three good months of production to be expected on this year's run and with a balance of 41,600 cars to be made on the basis of steel buys, it is not difficult to see why steel sales forces are booking only small fill-in tonnages.

They are marking time until the appearance of the first buys for 1939, which will not be made any earlier than necessary because no pressure is felt on either deliveries or prices this year, in contrast to last.

Reports from the East have it that Hupmobile interests are considering a proposal to make a new stock issue, asking each holder of present stock to subscribe to three shares of new stock for every one held now. Hupp's working capital is at low ebb, and it is general opinion some financial steps will have to be taken if idle assembly lines are to be put in motion again.

Sales of Lincoln Zephyr in foreign countries during the current model year up to April 1 were 2276 units, a 26 per cent improvement over the same period last year.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	1937	1938
Jan.	377,244	399,186	227,744
Feb.	300,810	383,900	202,872
March	438,943	519,022	†265,000
April	527,625	553,231	.....
May	480,518	540,377	.....
June	469,368	521,153	.....
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

†Estimated.

Week ended	
March 12	57,438
March 19	57,555
March 26	56,800
April 2	*57,500

*Revised.

(Production figures for the week ended April 9 will be found on page 29.)

■ THREE developments originating locally are tied in with what is taking the form of a national movement to tell industry's story to the public more effectively, with the idea of combating some of the misapprehensions emanating from labor unions and government agencies.

One is the campaign started by the Adcraft club here on the platform of "a square deal for management, labor, investor and consumer." It will take the guise of an educational effort using movies, radio, newspapers and speakers to convey the true picture of business to the public. (See p. 43.)

A second is the proposal of Walter L. Fry, militant president of Fry Products Inc., and well known throughout the country as the "sit-down boss," to organize a political group of small business operators with the goal of electing a business man to every seat in congress. Mr. Fry already has received 364 offers of co-operation, and has sent out only 1000 of a proposed 20,000 letters announcing his plan.

The third movement is not yet in the active stage, but as it is now projected, will involve direct contacts with farmers through units of the grange, for the purpose of educating farmers as to the true relationship between industry and agriculture.

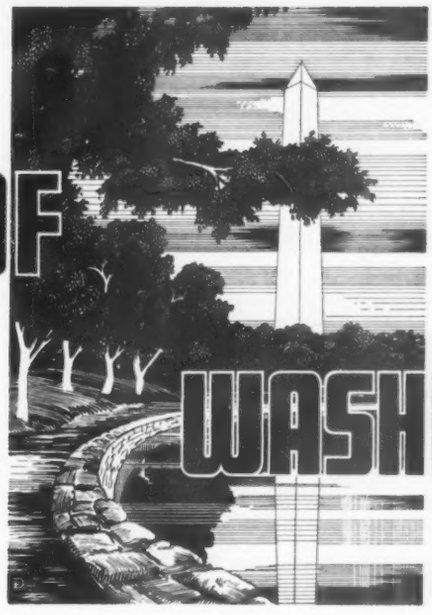
Lake Shipments Resumed

Boat docks were jammed here last week as water shipments of cars resumed to Lake Erie ports. The WILLIAM C. FITCH, GRAHAM C. WOODRUFF and CORALIA all cleared with cargoes of autos for Buffalo, and encountered only mild ice jams near the latter port.

Motor coach division of Gar Wood Industries Inc. is being transferred from the company's Highland Park plant here to the plant at Marysville, Mich., where it will share quarters with the new power boat division. Two complete coach assembly lines will be operated, necessitating the installation of new overhead balcony structures, new electrical feeder lines, five new spray booths with blowers, air compressor and other equipment. The 1938 coach line features a unit-type tubular steel frame in which mechanical units are mounted, with engine at the rear.

A crew of 65 is at work on an old mill site at Brooklyn, Mich., owned by Henry Ford, giving rise to the report of a new "village industry" plant such as those now operated in this district by Ford. Company officials stated, however, the men were merely straightening a creek which runs through the property.

WINDOWS OF WASHINGTON



BY L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ PUMP-PRIMING again is being discussed both within and without the administration. The understanding is that the President is being advised, on the one hand, that he should resume large governmental expenditures, while his more conservative advisers are telling him the worst of the recession is over and that he will be able to avoid increasing relief funds.

Just before returning to Washington from Georgia, the President conferred with Harry Hopkins of the WPA in connection with relief money for the fiscal year, beginning July 1. At a press conference early in January in speaking of relief funds, the President suggested not more than a billion dollars would be needed for the year. However, the President is being advised now in some quarters that two or three billion dollars will be necessary because of the present business situation.

Jesse Jones and Secretary of the Treasury Morgenthau, among others, are said to be advising the President that pump-priming is not necessary. They feel, it is reported, with other close advisers of the President, that the Glass bill, which expands lending powers of the RFC, will make a good start against the present depression. However, many left-wingers are doing everything they can to persuade the President that huge relief appropriations are necessary.

MARITIME COMMISSION ASKS MORE SHIP BIDS

The United States maritime commission in behalf of American Export Lines Inc., New York, has invited bids for construction of four cargo vessels, bids to be opened May 17.

The vessels are to be built for the American Export Lines under terms of the operating subsidy contract recently signed with the commission, in which it agreed to build 10 new cargo ships in the next five years, construction of four to start this year. This company now employs 24 ships between North Atlantic and Mediterranean ports, comprising one of the largest fleets in the American merchant marine.

All bids must be submitted on a fixed lump sum price basis, although bidders also may submit tenders on an adjusted price basis providing for an adjustment of the contract price on account of increases or decreases in cost of materials or labor where such adjustment does not exceed 15 per cent of these costs.

NEW BARS AGAINST COLLUSION IN BIDDING

Following recommendations by the President's interdepartmental price study group, the secretary of the treasury announced last week that, by direction of the President, "measures have been adopted to protect legitimate bidders for government contracts against unfair trade practices and to insure free competition among contractors and suppliers of material for government construction or other construction for which the government supplies all or part of the funds."

The procurement division of the treasury department, according to the announcement, will undertake purchase of all cement to be used directly by government departments or agencies. This became effective April 1.

In advertising for bids for cement the procurement division will request bidders to agree to enter into an "open contract," under which contractors on government work and contractors on other work for which the government supplies all or a part of the funds may purchase cement at prices quoted to the government. Bidders for the cement contract or contracts will also be requested to quote on the basis of delivery at the place of manufacture.

As an initial step in revision of procedure with respect to construction contracts in which the government has an interest, the procurement division will give effect, beginning April 1, to a new policy in relation to bids for construction of government buildings.

In the case of contracts for building construction, proposals for which are to be advertised after that date, bidders will be asked to certify that there has been no collusion with other bidders or prospective bidders in preparation of their bids. They will also be asked to present similar assurances with respect to subcontractors undertaking mechanical work. In the event evidence of collusion may be indicated, both contractors and subcontractors will be asked to make records available so that the government may assure itself that no unfair and discriminatory trade practices are being pursued.

Aims at Basing Point

The construction put upon this announcement by Washington observers is that under the new arrangement alleged collusive bidding on cement and other materials will be done away with. Buying cement at the place of manufacture, officials of the procurement division said, was intended to break the basing point system used in the cement industry. It will be recalled that an investigation of this is now being made by the federal trade commission to determine whether that industry is violating the anti-trust laws by this practice.

Just how far this new system in the procurement division will go can-

not be learned at this time. However, representatives of steel companies who sell to the government are of the opinion this system could not be put into effect in the case of steel, owing to the large variety of sizes, weights and kinds which are used in government projects.

EXTENDS PATENT LICENSE PERIOD TO FIVE YEARS

Ten days of hearings have been held by the house committee on patents, dealing with the McFarlane compulsory patent bill.

Every indication is that this bill will not be passed by the present congress, although members of congress interested in it are laying a background for the future. Representative McFarlane spoke on behalf of his bill and one or two other witnesses, but most witnesses represented small firms and, practically without exception, they expressed opposition. Mr. McFarlane has introduced a new bill along the lines of his former one, which has been discussed in some detail before. In the new bill, he provides that the commissioner of patents can issue licenses at the end of five years, instead of three, as previously provided.

AUTOMOBILE SELLING PLANS TO BE PROBED

Congress has completed action on a resolution calling for investigation by the federal trade commission of the automobile manufacturer-dealer relationship. The legislation awaits the President's signature. An appropriation of $50,000 was allowed for this survey.

Among other things, the resolution asks for determination by the commission of the extent of concentration of control and of monopoly in manufacturing, warehousing, distribution and sale of automobiles, accessories and parts. The resolution also asks the extent to which any anti-trust laws are being violated by the automobile industry. Provision is made for a report to congress within a year and for the commission's recommendations for remedial legislation.

LABOR RELATIONS ACT CHANGES ARE OPPOSED

John W. O'Leary, chairman of the executive committee of the United States Chamber of Commerce, appeared last week in opposition to S.3390 before a subcommittee of the senate committee on education and labor. This bill proposes an amendment to the national labor relations act.

Mr. O'Leary told the committee that enactment of the proposed amendment undoubtedly would cause increased confusion and added uncertainty and result in further retarding business.

"This is a time, I submit," he said, "when all of us should have as our objective the lessening of confusion, and the removal of uncertainties, in order that the economic processes of the country can go forward and the opportunities for employment may be increased and expanded. This bill has been introduced upon the responsibility of a well-known senator, and it has been considered by you and your committee to be worthy of hearings. Otherwise, I should have found it hard to believe that a measure with these provisions was before congress."

RFC LOANS TO INDUSTRY PROVIDED BY GLASS BILL

The senate last week passed the Glass bill, providing for loans to industry by the RFC. The Steagall bill, which is practically identical, was passed by the house also last week.

This bill is one of several proposals under consideration by administration officials to aid business. It was stated last week that an attempt is being made to batter down building prices in the hope of stimulating a construction boom.

The RFC has available about a billion and a half dollars for long-time loans, which it will be able to make as soon as the Glass bill becomes law. In addition to granting authority to loan money to business, the bill provides for loans to states and subdivisions for public works construction.

CHAMBER OF COMMERCE TO DISCUSS VITAL TOPICS

Questions of vital interest to business and industry will be discussed at the twenty-sixth annual meeting of the United States Chamber of Commerce, May 3-5. Subjects which will be taken up include anti-trust laws, foreign trade, labor relations, trade agreements, government competition and many other similar questions.

A special committee has submitted a report on regulation of competition, in which it reviews earlier declarations of the national chamber, and recommends that new legislation should be limited to businesses engaged in or directly affecting interstate commerce, should permit industry to formulate for itself rules of fair competition additional to general rules applicable by law to all industries.

The committee suggests further that the additional rules should be effective only when approved by governmental authority with powers solely to approve or disapprove, and should allow agreements under government supervision to increase the possibilities of keeping production in proper relation to consumption and provide for advance determination of proposed mergers.

A proposal has also been made to the chamber indorsing the general principle of reciprocal trade agreements, with a provision that in all negotiations the interests of agriculture should be safeguarded.

JAPAN PINCHES CLOSER TO SAVE STEEL FOR WAR

It is increasingly apparent that various measures adopted to curtail normal consumption of steel products in Japan, in order to assure an adequate supply for military requirements, are inadequate, according to reports received by the American commercial attache, Tokyo.

Only moderate success has resulted in plans to expand the domestic output because of delays and difficulties in securing essential material, principally because of the "inflexibility of exchange control measures." Local reports, he says, indicate the government has approached leading steelmakers with a plan for voluntary suspension of exports, excepting in shipments to Manchuria.

In order to create further economies in the consumption of iron and steel, the Japanese department of commerce and industry is making an investigation concerning the consumption of pig iron, scrap iron, steel pipes and tubes, hoop iron, steel sheets and plates, steel shapes, wire rods and bar steel. It is hoped that this investigation will result in making it possible to further curtail imports of pig iron and scrap iron into Japan.

ALL TIN SCRAP TO JAPAN

Announcement has been made by the state department that from March 1 to 31 15 licenses were issued for exportation of tin plate scrap. These licenses totaled 782 tons, all of which were destined for Japan, with total value of $14,275.

BRIER HILL GETS REFUND

The commissioner of internal revenue has announced a refund of $1,177,599 to the Brier-Hill Steel Co., Youngstown, O., now part of Youngstown Sheet & Tube Co. The refund includes overassessments of income and profits taxes for 1908 amounting to $1,172,532 and for 1919 amounting to $5067.

SURVEY LOW COST HOUSING

Experts of the national bureau of standards are making progress on its low cost housing survey, during the course of which they are making research of building materials. At the moment, they are going into the question of heating and ventilating equipment.

MEETINGS

STEEL ENGINEERS ARRANGE MEETING IN BALTIMORE

■ TWO technical sessions, a plant inspection and a dinner will feature the annual spring meeting of the Association of Iron and Steel Engineers in Lord Baltimore hotel, Baltimore, April 28-29.

The meeting will start with an informal dinner on the evening of the first day, this to be followed by a technical session at which three papers will be presented as follows: "Instrumentation of a Modern Hot and Cold Strip Mill," by J. L. Whitten, Brown Instrument Co., Philadelphia, and R. H. Ellis, United Engineering & Foundry Co., Pittsburgh; "Forged Rolls," by J. R. Adams, superintendent, special products division, Midvale Co., Philadelphia; and "The Chemistry of Lubrication," by George F. Bowers, Standard Oil Co. of Indiana, Chicago.

Two papers are scheduled for the second session on the morning of April 29, these being: "Study of Power Requirements of a 56-Inch Hot Strip Mill," by F. O. Schnure, electrical superintendent, Maryland plant, Bethlehem Steel Co., Sparrows Point, Md., and R. H. Wright, engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; and "Special Problems of Steel Mill Electrification," by L. A. Umansky, General Electric Co., Schenectady, N. Y.

During the afternoon, association members and guests will visit the 56-inch hot and cold strip mills and new rod and wire mills of Bethlehem's Maryland plant.

WESTINGHOUSE PREPARING THIRD ANNUAL TOOL FORUM

Westinghouse Electric & Mfg. Co. will conduct its third annual machine tool electrification forum at its East Pittsburgh, Pa., works, May 10-12.

The program will include papers on special and difficult problems presented by representatives of machine tool builders, and talks by the company's works, application and design engineers. There will be inspection trips through Westinghouse research laboratories and manufacturing plants.

Last year's forum attracted 72 delegates representing 50 tool builders; a larger attendance is expected this year.

DETROIT A.S.T.M. PLANS CORROSION SYMPOSIUM

Detroit district committee, American Society for Testing Materials, will conduct a symposium on protection against corrosion at a dinner meeting in Detroit Leland hotel, April 19. Four short papers will be presented as follows: "Corrosion-Resistant Alloys," by H. W. Gillett, chief technical advisor, Battelle Memorial institute, Columbus, O.; "Plating," by C. E. Heussner, materials engineer, Chrysler Corp., Detroit; "Pretreating Metals," by Ralph Wirshing, research laboratories division, General Motors Corp., Detroit; and "Organic Coatings," by J. L. McCloud, metallurgical chemist, Ford Motor Co., Dearborn, Mich.

PITTSBURGH GROUPS WILL HOLD WELDING CONFERENCE

Engineers Society of Western Pennsylvania and the Pittsburgh section, American Welding society, will sponsor a joint regional welding conference in William Penn hotel, Pittsburgh, April 29. The program schedules afternoon and evening sessions.

At the afternoon session, R. E. Kinkead, consulting engineer, Cleveland, will present a paper on "Welding in Production of Steel." A. S. Low, vice president and chief engineer, Austin Co., Cleveland, will speak on "Welded Construction in Some Recent Industrial Buildings." C. I. MacGuffie, welding specialist, General Electric Co., Schenectady, N. Y., will present motion pictures showing welding arcs and flash welding of rails.

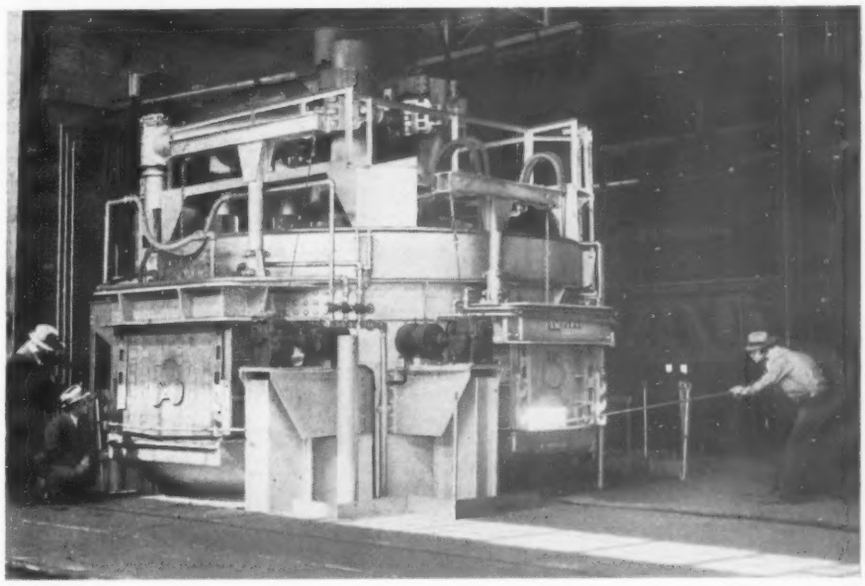
P. G. Lang Jr., engineer of bridges, Baltimore & Ohio railroad, Baltimore, and A. E. Gibson, president, Wellman Engineering Co., Cleveland, president and past president, respectively, American Welding society, will address the evening meeting. H. C. Hettelsater, executive engineer, Harnischfeger Corp., Milwaukee, will present a paper on "Welding in Construction of Cranes and Power Excavators."

TRACTOR ENGINEERS TO CONVENE IN MILWAUKEE

Society of Automotive Engineers will hold its 1938 national tractor meeting in Schroeder hotel, Milwaukee, April 14-15. The first session will be devoted to transmissions and axles at which E. G. Boden, experimental engineer, Timken Roller Bearing Co., Canton, O., will present a paper "Deflection Tests on Transmissions and Axles." In the afternoon, the engineers will visit Allis-Chalmers Mfg. Co.'s tractor plant.

International Harvester Co.'s plant will be inspected on the morning of the second day. In the afternoon the society will conduct a symposium on "Engine Wear — Ways and Means of Designing Longer Life Into Tractor Engines." The meeting will close with the annual dinner at which Dr. James S. Thomas, president, Chrysler Engineering institute, Detroit, will speak on "New Frontiers for Smart People."

"Making Bottom" in New 25-Ton Electric Furnace



■ **This illustrates an important recent event in the alloy and tool steel division of Bethlehem Steel Co.'s Bethlehem plant, Bethlehem, Pa. The bottom was burned in a new 25-ton electric furnace—an unusually large unit. Average capacity of electric furnaces is about 5 tons. The bottom material is fused to the refractory brick base by means of heat generated by the electric arc. The three 18-foot graphite electrodes in this furnace are made up of 6-foot sections screwed together. Furnace will be used in making alloy and special carbon steels**

Steel Industry Returns 6% on Invested Capital; Net Profit Up 54.7% in 1937

■ TWENTY-TWO leading steel producers, representing 90.18 per cent of total ingot capacity, in 1937 earned $242,058,038 after taxes and other charges but before funded debt interest and dividends, STEEL's twelfth annual financial survey shows. Comparable earnings for the same interests in 1936 were $167,954,226.

Last year's earnings were the highest since 1929 when 21 leading companies earned $399,751,660. In 1932, 26 producers reported $116,887,789 loss before interest and dividends.

After deducting bond interest, the 22 companies in 1937 had net earnings amounting to $212,440,521, compared with $137,263,083 in 1936. Allowing for $50,655,226 for preferred dividend requirements, their 1937 net was $161,785,295, compared with $87,266,814 in 1936.

Total earnings of $242,058,038 last year represented a 6.1 per cent return on $3,966,690,871 capitalization. This compares with 4.4 per cent for the same interests in 1936. Substantially the same producers reported 2.09 per cent in 1935, 0.36 per cent in 1934, a deficit of 0.9 per cent in 1933 and a loss of 2.85 per cent in 1932. Highest earnings in recent years were 9.88 per cent on capitalization in 1929.

Additional Stock, More Surplus Increase Capitalization; Funded Debt Reduced

Total capitalization of $3,966,690,871 represents an increase of $147,932,309 over 1936. This resulted from issuance of new stock, both common and preferred, and increased surplus. Total funded indebtedness was reduced.

Eighteen of the 22 companies increased surplus during 1937. Total for all companies increased 11 per cent from $641,011,876 to $711,421,470.

Number of common shares increased from 29,907,681 to 32,869,259 and their valuation from $1,722,598,149 to $1,775,705,031. Preferred shares valuation rose from $681,651,105 to $727,367,310. Funded debt was decreased 3 per cent, from $686,691,418 to $665,811,286.

Rustless Iron & Steel Corp. headed the list in total earnings on capitalization with 22.59 per cent. Ludlum Steel Co. was second with 12.27. Followed National Steel Corp. with 11.26 per cent, Midvale Co. with 11.15 per cent, and Inland Steel Co. with 10.14 per cent. United States Steel Corp.'s earnings on capitalization amounted to 5.83 and Bethlehem Steel Corp.'s 5.82 per cent.

Capitalization of the 22 companies last year averaged $62.87 per ton of ingot capacity, compared with $60.87 in 1936. Highest for 1937 was reported by Ludlum, at $240.18; Vanadium-Alloys Steel Co. reported $182.07. U. S. Steel averaged $66.61, Bethlehem $71.16, and Republic $51.53.

Total earnings averaged $3.84 per ton of ingot capacity for the 22 producers last year, compared with $2.68 in 1936. Ludlum headed the list with $29.48, while Rustless reported $19.98 and Vanadium-Alloys $17.61. Of producers whose principal product is ordinary carbon steel, National Steel was first with $7.49 per ton of capacity; Inland was second with $6.21.

Common Share Earnings Increase 68.5 Per Cent; Average $4.92

Size of company apparently had little effect on earnings per ton of capacity, although leading interests made a relatively better showing in 1937 than in 1936. U. S. Steel reported $3.88, or 4 cents above the average for the 22 companies, and rated tenth in the list. Bethlehem earned $4.14 per ton of capacity, and rated ninth. In 1936, Bethlehem and U. S. Steel rated fifteenth and sixteenth respectively.

Earnings per common share for the 22 companies averaged $4.92 in 1937, compared with $2.92 in 1936, and 2 cents in 1935. National Steel was high with $8.31, followed by Inland with $8.05, U. S. Steel with $8.01 and Bethlehem with $7.64.

Assets of the 22 producers totaled $4,389,215,605 in 1937, against $4,210,354,654 in 1936. Current assets were $1,201,373,169, compared with $1,147,282,838. Current liabilities were $283,262,467 against $267,926,727.

Opposite this page is an insert giving detailed comparisons for 1937 and 1936. Additional copies may be had by subscribers on request.

Only change in the list of companies included is the addition of Rustless Iron & Steel Corp. and the omission of Gulf States Steel Co. which early last year was absorbed by Republic.

STEEL hereby acknowledges with sincere thanks the co-operation of the companies in supplying this detailed data.

Financial Analysis of the

Earnings, Capitalization, Assets and Liabilities of 22 Producers Havi

	No. Shares Common Stock Outstanding		Common Stock		Preferred Stock		Fund
	1937	1936	1937	1936	1937	1936	1937
United States Steel Corp.....	8,703,252	8,703,252	$870,325,200	$870,325,200	$360,281,100	$360,281,100	$120,572,207
Bethlehem Steel Corp.....	3,185,114	3,191,614	302,585,830	303,203,330	112,066,440	112,066,440	184,172,464
Republic Steel Corp.....	5,832,124	4,127,264	132,499,470	93,995,228	40,190,050	40,190,050	92,859,148
Jones & Laughlin Steel Corp.	576,320	576,320	57,632,000	57,632,000	58,713,900	58,713,900	32,063,470
Youngstown Sheet & Tube Co.	1,675,008	1,384,752	105,039,670	86,803,097	15,000,000	15,000,000	58,500,000
National Steel Corp.....	2,167,877	2,162,277	54,196,925	54,056,925	None	None	59,054,781
American Rolling Mill Co.....	2,868,517	2,319,865	71,739,009	70,096,509	45,000,000	1,931,900	3,234,816
Inland Steel Co.....	1,573,950	1,499,000	57,311,852	50,566,352	None	None	52,900,000
Wheeling Steel Corp.....	563,212	388,091	28,160,600	19,404,550	38,126,800	38,154,700	32,900,000
Crucible Steel Co. of America	450,000	450,000	44,569,773	43,289,773	23,880,000	23,880,000	6,250,000
Otis Steel Co.....	896,597	891,130	4,482,985	4,455,650	10,675,163	11,103,140	11,251,000
Pittsburgh Steel Co.*.....	354,900	253,500	3,549,000	25,350,000	10,475,000	10,475,000	6,467,000
Lukens Steel Co.†.....	317,976	317,976	3,179,760	3,179,760	None	None	3,559,400
Allegheny Steel Co.....	753,985	750,655	4,712,637	4,691,594	3,342,600	3,342,600	None
Sharon Steel Corp.....	387,774	377,309	3,897,740	3,773,090	5,972,000	4,000,000	None
Granite City Steel Co.....	382,488	382,488	8,483,821	8,483,821	None	None	None
Continental Steel Corp.....	200,576	200,579	5,276,513	5,276,586	2,455,209	2,512,275	1,277,000
Midvale Co.	200,000	200,000	10,574,621	10,574,621	None	None	None
Laclede Steel Co.....	206,250	206,250	4,125,000	4,125,000	None	None	750,000
Vanadium-Alloys Steel Co.*...	210,000	210,000	2,000,000	2,000,000	None	None	None
Ludlum Steel Co.....	500,000	500,000	500,000	500,000	None	None	None
Rustless Iron & Steel Corp....	863,339	815,359	862,625	815,063	1,189,048	None	None
Totals.....	32,869,259	29,907,681	$1,775,705,031	$1,722,598,149	$727,367,310	$681,651,105	$665,811,286

	Net Earnings Before Dividends		Earnings Per Common Share		Per Cent Total Earnings on Capitalization		Total Earnings Per Ton Ingot Capacity		Rated I Capac Gross
	1937	1936	1937	1936	1937	1936	1937	1936	1937
United States Steel Corp.....	$94,944,358	$50,583,356	$8.01	$2.91	5.83%	3.30%	$3.88	$2.15	25,790,000
Bethlehem Steel Corp.....	31,819,596	13,901,006	7.64	2.09	5.82	3.25	4.14	2.18	9,360,000
Republic Steel Corp.....	9,044,148	9,586,922	1.14	1.74	4.20	4.72	2.16	2.41	6,453,000
Jones & Laughlin Steel Corp.	4,788,799	4,129,600	1.18	0.03	3.19	2.66	1.73	1.45	3,660,000
Youngstown Sheet & Tube Co.	12,190,649	10,564,501	6.79	7.03	7.41	7.13	4.74	4.56	3,120,000
National Steel Corp.....	17,801,893	12,541,842	8.31	5.80	11.26	8.78	7.49	5.50	2,700,000
American Rolling Mill Co.....	8,231,335	6,441,677	2.55	2.73	7.52	7.53	3.58	3.25	2,551,120
Inland Steel Co.....	12,665,317	12,800,545	8.05	8.54	10.14	11.79	6.21	6.24	2,340,000
Wheeling Steel Corp.....	4,238,488	4,115,388	3.74	4.71	5.23	5.09	3.30	3.20	1,750,000
Crucible Steel Co. of America	4,017,931	3,120,356	5.21	3.22	4.20	3.45	4.98	4.05	875,000
Otis Steel Co.....	2,320,030	1,980,149	1.71	1.30	8.97	8.37	3.58	3.26	828,000
Pittsburgh Steel Co.*.....	1,391,665	265,360‡	1.86	3.94‡	4.73	0.38	2.50	0.23	720,000
Lukens Steel Co.†.....	158,218	112,205	0.50	0.35	3.11	2.86	0.52	0.39	638,000
Allegheny Steel Co.....	1,813,707	1,829,137	2.10	2.12	9.59	9.77	3.63	3.84	500,000
Sharon Steel Corp.....	1,345,810	1,305,852	2.83	3.04	8.94	9.78	2.80	2.95	500,000
Granite City Steel Co.....	254,225	288,687	0.67	0.75	2.14	2.39	0.64	0.72	400,000
Continental Steel Corp.....	814,553	736,228	3.20	2.78	6.72	6.25	3.11	2.86	280,000
Midvale Co.	1,341,816	1,266,168	6.71	6.33	11.15	10.35	5.01	4.72	268,000
Laclede Steel Co.....	455,729	240,656	2.21	1.17	7.29	4.02	2.04	1.12	235,000
Vanadium-Alloys Steel Co.*...	968,693	592,216	4.80	2.82	9.67	5.92	17.61	10.30	55,000
Ludlum Steel Co.....	1,120,422	1,041,245	2.24	1.95	12.27	12.23	29.48	27.40	38,000
Rustless Iron & Steel Corp....	713,139	350,707	0.72	0.43	22.59	25.17	19.98	19.62	35,700
Totals.....	$212,440,521	$137,263,083	$4.92	$2.92	6.10%	4.40%	$3.84	$2.68	63,096,820

‡Loss. †Fiscal year ends Oct. 16. *Fiscal year ends June 30.

Totals for 1937 and 1936 for the columns, "Net Earnings before Dividends," do not take into consideration the requirement (not actual payments) for preferred dividends. In computing earnings per common share these totals, adjusted for the preferred dividend requirement, are used. In figuring earnings per common share for individual companies the same method is followed. In other computations, total earnings before bond interest or preferred dividend requirement are the base.

the Steel Industry for 1937

cers Having an Aggregate Annual Ingot Capacity of 63,096,820 Gross Tons

Funded Debt 1937	Funded Debt 1936	Surplus 1937	Surplus 1936	Total Capitalization 1937	Total Capitalization 1936	Total Earnings Before Div. and Int. on Bonds 1937	Total Earnings Before Div. and Int. on Bonds 1936	Total Earnings Per Ton Ingots Produced 1937	Total Earnings Per Ton Ingots Produced 1936
$120,572,207	$112,287,669	$280,356,144	$252,660,717	$1,717,920,426	$1,682,360,470	$100,085,446	$55,501,787	$5.40	$3.28
184,172,464	155,982,619	67,248,455	57,562,527	666,073,189	628,814,916	38,786,013	20,415,453	5.34	3.41
92,859,148	110,974,148	67,002,376	64,299,963	332,551,044	309,459,389	13,963,869	14,607,869	3.48	3.40
32,063,470	34,595,588	50,204,472	49,304,909	198,613,842	200,246,397	6,330,951	5,321,608	2.56	2.24
58,500,000	78,253,000	20,993,897	19,375,547	199,533,566	199,431,644	14,785,948	14,214,536	7.36	6.41
59,054,781	59,000,000	66,433,209	56,131,836	179,684,916	169,188,761	20,231,364	14,849,830	....	....
3,234,816	24,940,494	12,623,475	12,660,859	132,597,300	109,629,762	9,140,629	8,235,031	4.98	4.27
52,900,000	44,000,000	33,151,831	29,282,078	143,363,682	123,848,429	14,539,343	14,603,978	7.23	6.62
32,900,000	33,600,000	11,186,352	18,650,313	110,373,752	109,809,563	5,774,213	5,592,680	4.35	4.20
6,250,000	7,500,000	29,178,213	27,895,808	103,877,986	102,565,581	4,361,680	3,543,273	....	....
11,251,000	10,827,500	6,608,346	5,816,053	33,017,494	32,202,343	2,961,325	2,695,213	3.92	3.49
6,467,000	6,947,000	17,620,137	698,479	38,111,137	43,470,479	1,803,375	166,722	2.89	0.45
3,559,400	3,633,400	3,841,875	3,532,262	10,581,035	10,345,422	329,333	295,868	0.36	0.30
None	None	10,864,241	10,689,172	18,919,478	18,723,597	1,813,707	1,829,137	6.15	5.66
None	2,000,000	5,821,604	5,325,196	15,691,344	15,098,286	1,402,809	1,477,262	3.26	3.00
None	None	3,398,198	3,574,269	11,882,019	12,058,090	254,225	288,687	0.95	1.51
1,277,000	1,400,000	3,960,263	3,631,330	12,968,986	12,820,191	871,509	801,800	3.23	2.74
None	None	1,463,172	1,650,598	12,037,793	12,225,219	1,341,816	1,266,168	22.57	26.88
750,000	750,000	1,718,231	1,675,002	6,593,231	6,550,002	478,229	263,156	2.36	1.35
None	None	8,014,881	7,998,158	10,014,881	9,998,158	968,693	592,216	126.05	109.41
None	None	8,627,476	8,018,570	9,127,476	8,518,570	1,120,422	1,041,245	....	....
None	None	1,104,622	578,230	3,156,294	1,393,293	713,139	350,707	....	....
$665,811,286	$686,691,418	$711,421,470	$641,011,876	$3,966,690,871	$3,818,758,562	$242,058,038	$167,954,226	....	....

Rated Ingot Capacity Gross Tons 1937	Rated Ingot Capacity Gross Tons 1936	Capitalization Per Ton Ingot Capacity 1937	Capitalization Per Ton Ingot Capacity 1936	Total Assets 1937	Total Assets 1936	Current Assets 1937	Current Assets 1936	Current Liabilities 1937	Current Liabilities 1936
25,790,000	25,772,400	$66.61	$65.28	$1,918,729,289	$1,863,976,519	$480,737,120	$485,166,359	$117,331,071	$103,557,710
9,360,000	9,360,000	71.16	67.18	715,809,795	676,060,838	189,097,106	145,635,176	37,823,318	37,626,900
6,453,000	6,053,000	51.53	51.12	364,658,739	343,949,673	93,254,096	93,523,639	16,782,839	20,717,154
3,660,000	3,660,000	54.27	54.71	219,642,737	220,670,843	53,162,448	63,065,622	15,004,422	14,461,558
3,120,000	3,120,000	63.95	63.92	220,641,266	213,822,894	74,650,237	70,291,596	17,445,737	11,137,190
2,700,000	2,700,000	66.55	62.66	204,452,622	189,530,502	54,773,881	57,212,632	20,611,576	16,602,102
2,551,120	2,531,120	51.98	43.31	145,844,560	128,649,729	59,060,612	44,499,210	10,442,154	17,516,671
2,340,000	2,340,000	61.27	52.93	158,326,380	137,644,116	52,327,198	48,731,061	10,056,137	9,309,581
1,750,000	1,750,000	63.07	62.75	123,551,253	118,824,534	44,028,183	43,890,615	10,663,727	6,542,839
875,000	875,000	118.72	117.22	110,109,344	110,596,352	21,786,516	21,215,209	5,741,417	7,575,565
828,000	828,000	39.88	38.89	39,025,847	36,156,078	12,121,457	9,974,287	2,188,085	3,087,227
720,000	720,000	52.93	60.38	42,735,851	46,121,064	15,493,093	12,007,254	4,375,399	2,440,022
638,000	754,000	16.58	13.72	15,692,169	14,057,275	5,169,811	4,701,590	4,586,617	3,071,079
500,000	476,000	37.84	39.34	20,794,596	22,973,010	7,815,472	9,741,892	1,771,988	4,111,393
500,000	500,000	31.38	30.19	17,343,286	18,157,938	6,185,691	7,329,782	1,194,586	2,448,672
400,000	400,000	29.70	30.14	14,839,614	14,356,420	4,179,327	3,634,781	1,164,331	2,043,525
280,000	280,000	46.32	45.79	14,229,675	14,957,122	6,124,874	6,810,724	909,925	1,828,256
268,000	268,000	44.92	45.62	14,324,616	13,823,873	7,193,314	6,616,410	1,390,950	985,262
235,000	235,000	28.06	27.87	7,113,276	7,559,629	2,883,629	3,057,849	1,176,578	882,229
55,000	57,500	182.07	175.40	6,831,847	6,376,700	4,508,996	3,992,816	845,007	427,696
38,000	38,000	240.18	224.08	11,020,464	10,066,860	5,403,044	5,174,127	1,414,518	1,076,704
35,700	17,875	88.41	77.95	3,498,379	2,022,635	1,417,064	1,010,207	342,085	477,392
63,096,820	62,735,895	$62.87	$60.87	$4,389,215,605	$4,210,354,654	$1,201,373,169	$1,147,282,838	$283,262,467	$267,926,727

Per Cent Earned on Capitalization

Year		Year	
1925	5.61	1932	‡2.85
1926	6.86	1933	‡0.90
1927	5.22	1934	0.36
1928	6.55	1935	2.09
1929	9.88	1936	4.40
1930	4.54	1937	6.10
1931	0.40		

‡Loss.

Co-operative Educational Campaigns Effective in Awakening the Public

■ AWAKENING realization of the importance of industry's relations with the public is a healthy sign of the times. STEEL frequently has pointed out the values that accrue from intelligent public relations programs but adequate action has been slow to develop.

In conducting public relations work effectively it is in the co-operative movement that the greatest possibilities seem to lie. An example is the campaign which a small group of industrial leaders at Evansville, Ind., developed last year on a platform of "industrial peace." In the space of less than a year it has grown to city-wide proportions among a population of 112,000, of whom 24,000 are industrial workers.

This co-operative league, which now has 17 sponsors, aims to do three things: Give to citizens the facts about the city's industries; encourage general discussion of business and industrial questions; oppose all unAmerican groups that threaten, with appeals to force rather than to reason, industrial strife.

Selling Understanding of Industrial Aims Important

This educational effort was visioned as a process of selling to the entire populace, not workers alone, a sound and business-like understanding of the basic aims, principles, policies and methods of decent business. Newspaper advertisements, speakers at churches and elsewhere, radio programs, moving pictures, special booklets and public forum meetings are the standard tools of the public relations expert adapted to this campaign.

E. St. Elmo Lewis, who has a hand in guiding this work at Evansville, points out significantly that "workers—the vast majority of whom are level-headed—can be reached by such a campaign and want to help. The plant management can be aided to make its public and industrial relations more sound, and an informed public opinion will take the side of business trying to do a worthwhile job with a decent regard for the rights of all."

Recently the Adcraft club of Detroit has been studying the possibilities of applying such a plan in that city. It has formed a "business research committee" and set about the task of developing an educational publicity campaign to "tell industry's story" in a thoroughly nonpartisan manner.

Square Deal to Everybody Is the Slogan at Detroit

The suggested platform is: "The Square Deal—for Labor, Investor, Manager and Consumer." Questionnaires were sent to 5000 business men in the community asking their opinions on the value of such a campaign, how the facts can be given to the public, who shall conduct the movement and what obstacles can be removed by a better public understanding of the facts. Replies have been overwhelmingly favorable, the only caution urged being that the undertaking must above all be impartial.

There is little question that a growing section of the American public is becoming aware of the significance of public policies which strangle business, reduce earnings and create hardships to the average citizen. Movements such as that at Evansville and that in its embryo stage at Detroit are among the best means of combating that which is uneconomic and vicious in our government. It is to be hoped that similar co-operative educational movements will be launched without delay in other industrial centers.

Response of Activity to Seasonal Influences Is Weak

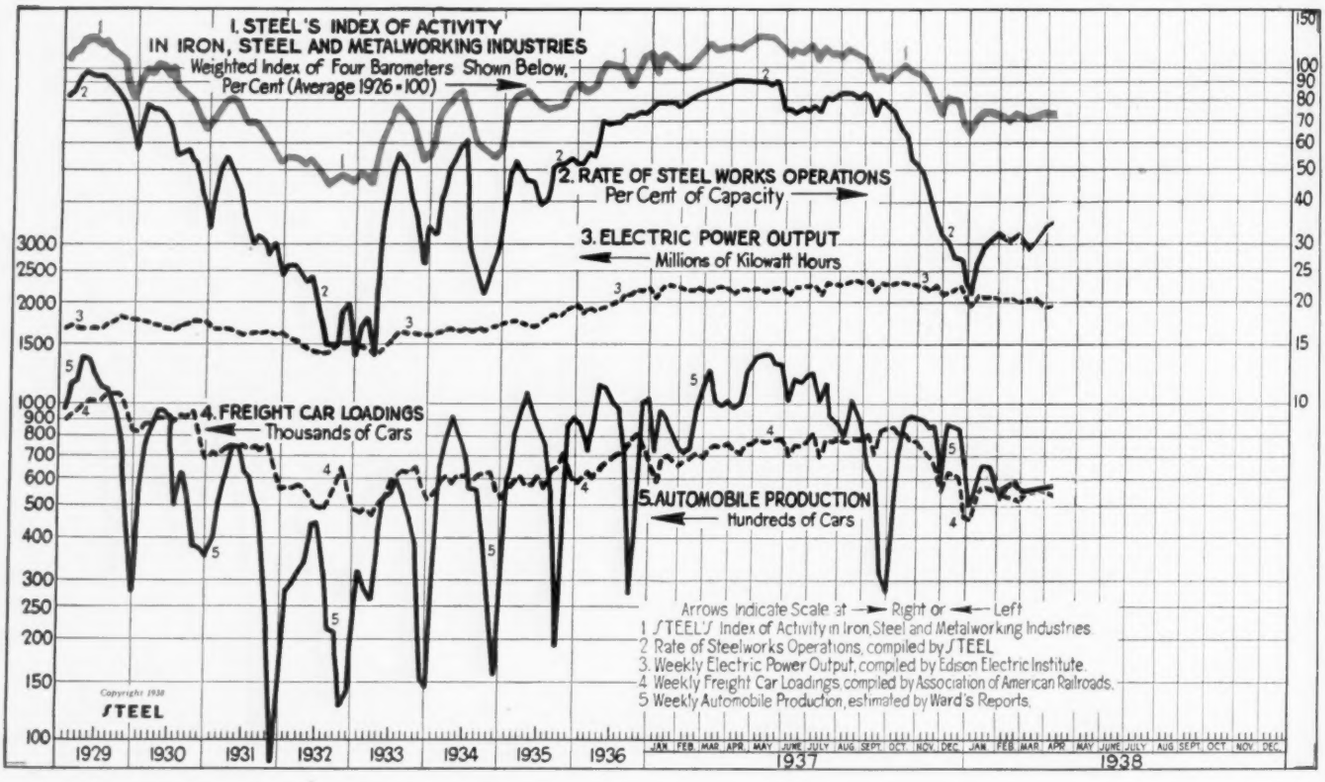
■ THREE of the four barometers composing STEEL'S index of activity in the iron, steel and metalworking industries showed moderate gains in the week ended April 2. However, a sharp loss in freight traffic more than offset these gains. Consequently, STEEL'S index dropped from 72.4 in the week ended March 26 to 72.3 per cent in the week ended April 2.

After registering a sharp increase of 32,620 cars to 572,952 in the week ended March 26, revenue freight car loadings declined in the week ended April 2 to approximately 540,000 cars.

Steelworks operations gained one point to 36 per cent in the week ended April 2, again breaking into a new high for this year. However, the rate still is below the level of mid-November of last year when it stood at 39.0 per cent.

Weekly auto production has yet to show the seasonal impetus usually apparent at this time. For the last four weeks this barometer remained between the 56,000 and 58,000 car-per-week level. However, production schedules are expected to be adjusted slightly upward through April resulting in an estimated output of 240,000 cars. While this is well above the 1932 and 1933 levels it remains far below the volume of 553,415 assemblies in April, 1937.

Electric power output, which broke sharply under the 2,000,000,000 kilowatt-hour level in the preceding week, climbed back to 1,978,753,000 in the week ended April 2.


1. STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below,
Per Cent (Average 1926 • 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1. STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2. Rate of Steelworks Operations, compiled by STEEL.
3. Weekly Electric Power Output, compiled by Edison Electric Institute.
4. Weekly Freight Car Loadings, compiled by Association of American Railroads.
5. Weekly Automobile Production, estimated by Ward's Reports.
Copyright 1938
STEEL
1929 1930 1931 1932 1933 1934 1935 1936
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1937
1938

STEEL'S index of activity declined 0.1 points to 72.3 in the week ended April 2:

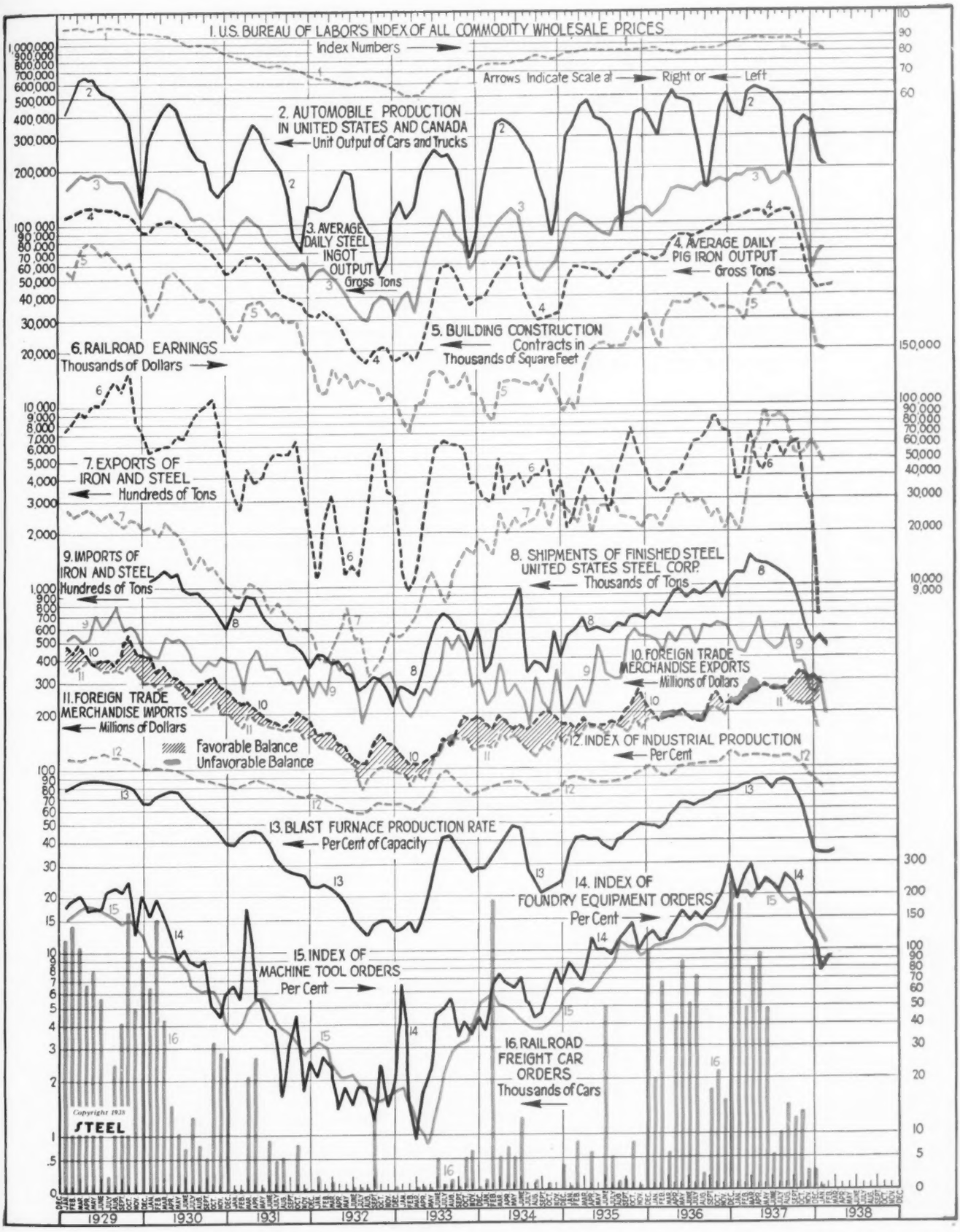
Week ending	STEEL'S Index of Activity Index No. 1938	1937	Steelworks Operating Rate Per Cent 1938	1937	Electric Power Output Million KWH 1938	1937	Freight Car Loadings 1938	1937	Weekly Auto Output 1938	1937
Jan. 1	62.7	96.6	21.0	79.0	1,998	2,069	457,359	587,953	49,550	71,800
Jan. 8	70.1	107.8	26.0	79.5	2,139	2,244	552,314	698,529	54,084	96,780
Jan. 15	74.4	106.7	29.0	79.0	2,115	2,264	580,600	700,238	65,735	91,685
Jan. 22	74.7	104.0	30.5	80.0	2,108	2,256	570,333	670,376	65,418	81,395
Jan. 29	73.8	99.6	33.0	76.0	2,098	2,214	553,176	659,790	59,365	74,148
Feb. 5	70.9	100.8	31.0	79.5	2,082	2,201	564,740	675,026	51,443	72,295
Feb. 12	71.2	101.9	30.0	81.0	2,052	2,199	542,991	691,618	57,810	72,850
Feb. 19	71.9	108.8	31.0	83.0	2,059	2,211	535,790	714,884	59,100	95,698
Feb. 26	70.3	112.8	30.5	84.0	2,031	2,207	511,930	696,727	56,977	111,915
Mar. 5	70.1	117.9	29.5	86.0	2,035	2,199	552,916	734,127	54,440	126,975
Mar. 12	70.8	112.7	30.0	87.0	2,014	2,212	556,664	748,993	57,438	101,684
Mar. 19	71.3	113.1	32.0	89.0	2,017	2,211	540,332	759,269	57,555	99,013
Mar. 26	72.4†	114.0	35.0	90.0	1,975	2,200	572,952†	761,109	56,800	101,046
April 2	72.3*	112.0	36.0	91.5	1,978	2.146	540,000*	726,687	57,500	97,005

*Preliminary. †Revised.

STEEL TREND

Key:	Feb. 1938	Key:	Feb. 1938	Key:	Feb. 1938	Key:	Feb. 1938
1	79.7	5	18,903,000	9	19,589	13	34.5*
2	202,872	6	2,136,481‡	10	289,437,000†	14	90.4
3	70,969	7	460,640	11	170,763,000†	15	112.3
4	47,851*	8	474,723	12	79	16	109

*March. †January. ‡Deficit (not shown on chart).



Key: 1. U. S. Bureau of Labor's Index of all Commodity Wholesale Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

QUOTATION

Many companies neglect to inform customers in detail on what they are quoting, leaving many matters to guess and later controversy. Here suggestions are offered for a quotation form

By EUGENE CALDWELL
General Manager
Wrought Washer Mfg. Co.
Milwaukee

■ ABOUT THE BEST way to start an argument with a customer is to be indefinite about what you are quoting on and have the customer accept your offer with some other conditions or reservations in mind. Most companies doubtlessly feel it pays to get into a good argument with a customer once in a while, for very few use any carefully drawn conditions under which they are quoting.

Many concerns use only an ordinary letterhead for submitting quotations while others using a quotation form state no conditions which enlighten the prospective customer as to what is being quoted on. Some information on how to order your product is also an excellent thing to give your customer at the time of submitting your price.

Tolerances Misunderstood

The question of tolerances is a common ground for misunderstanding between customer and supplier. Often the customer is not familiar with the practice in your industry, whereas he orders without giving any tolerances not knowing the ordinary commercial product will not be nearly accurate enough for his requirements.

The best example I can think of concerning a misunderstanding of tolerances between customer and manufacturer is the case where a steel plate was ordered 48 inches square and ½-inch thick. The order carried the notation "Must be perfectly flat." The manufacturer spent a number of hours planing, grinding, and lapping the plate, and when the vendee received an invoice for $374.25, he kicked. He explained they "only wanted to set a stove on top of the plate."

In analyzing the information that should go on a quotation form, we have classified it as follows:

(a) *Headings* — Headings, of course, should be arranged so the prospect knows what company is quoting and the complete address. Perhaps a keyed address should be used because when an order comes in to that address, it can immediately be determined that the order is based upon a quotation previously made. Perhaps the address of the prospective customer should be so arranged that window envelopes could be used.

(b) *Material to Save Typing*—Such phrases as "we quote on:" would permit filling in the details of the items being quoted on and permit the minimum of typing effort.

(c) *Ordering Instructions*—Unless your product is exceedingly simple, it is advisable to include some ordering instructions. Because of the length of these instructions it would perhaps be necessary to have them appear on the back, but a reference to them can be made on the front of the quotation.

(d) *Important Conditions*—There are certain conditions to every quotation we want the customer to be sure to read. Because of the importance of some of them, it would be advisable to place them on the front of the form, but on account of their length it is not possible to give them this position. The best that can be done is to place those of major importance on the front and prominently call attention on the front to the conditions shown on the back. It is further suggested that the conditions be arranged in the order of their importance for the reason that if the buyer reads only the first paragraph, he will have read the most important thing.

(e) *Less Important Conditions*—The less important conditions, of course, should go on the back of the form. Most of these have legal significance only. In fact the manufacturer is not particularly interested in whether the prospective customer reads them or not.

Companies Are Hesitant

(f) *Tolerances*—Many companies are hesitant in publishing tolerances on the product furnished with the thought that such publication will make their customers tolerance conscious, and thus more exacting about their product. While this is true and must be taken into consideration to some extent, still the writer feels everything is to be gained by telling your customers exactly what you are agreeing to furnish.

The tolerance specifications of many companies are too extensive to reproduce in full on the back of the quotation form. In such a case it is suggested that a general reference be made on the quotation form

Items of major importance in the quotation should appear on the front of the form. Those of lesser importance may be included on the back

to tolerance sheets, which should be made available for those customers who request them.

(g) *Advertisements* — A small amount of advertising matter seems to be worth while on the quotation form. A few small illustrations of different products down the side or on the bottom may cause a customer for one of your products to consider others. Some companies add two additional pages to the quotation form, making a 4-page folder out of it, on which they show views of their plant and products, and descriptions of the services they are able to offer.

The following tabulates the material appearing on the back of the quotation form adopted by the Wrought Washer Mfg. Co. Many of these conditions apply to the specific industry in question and hence are suggestive only. On the other hand other conditions are general in their application to other industries. Although the important conditions have been arranged in the order of their importance, the less important ones have been arranged according to their relations—one with the other.

Ordering Instructions

(a) When ordering flat washers be sure to specify: (1) quantity (2) whether pieces, pounds, hundredweight, or kegs, (3) outside diameter in inches, (4) inside diameter or hole in inches, (5) thickness in Birmingham Wire Gage (BWG) number or in fraction or decimal of an inch (specifying which), (6) material, (7) shape, and (8) description.

(b) Orders for formed washers and stampings, as well as intricate shapes of flat washers, must be accompanied by your sketch or drawing unless the shape can be easily and adequately described, the part number taken from our catalog is specified, or we have your drawing on file.

(c) Showing the size of the bolt or screw with which the washer is to be used is always helpful, and information as to the use of the washer or stamping enables us to be of assistance in recommending substitute sizes available from stock or detecting errors in your specifications.

(d) Our standard shipping container is the 200 pound (net) keg, and if orders are based upon multiples of this quantity, extra packing charges will be avoided and shipments expedited. On washer orders freight is allowed on shipments of 400 pounds or more.

(e) If other than our standard tolerances are required, these should be carefully noted on the order.

(f) We carry over 3000 sizes of washers and stampings in stock and maintain an inventory of over 20,000 tools for making up special

sizes and shapes. In many cases specifications can be changed slightly to a standard stock size or to a size for which we have tools and thus economy is secured and delivery facilitated. If you do not have them already, send for our catalog of standard sizes, our stock list of standard and special washers and stampings carried in stock, and our tool list of sizes and shapes that can be made up without tool cost.

Conditions Included

1. *Tolerances*—Unless otherwise noted our price includes products manufactured to our standard tolerances as shown on our tolerance sheets. Standard washers are manufactured to tolerances established by the Plain Washer Manufacturers' association. Closer tolerances than these can, of course, be furnished but at an additional cost. Dimensions taken from the buyer's sample will be to the nearest 1/64-inch, our standard tolerances to apply from that dimension. Unless otherwise specified a regular punched edge will be furnished, and dimensions shall be measured from the sheared portion and not from the broken portion of the edge. Shaved, turned, or ground edges (and in certain cases mill edges) can be furnished at added cost.

Owing to the thickness tolerance of one gage up or down for standard washers and standard mill tolerances for thickness of special washers, the number of pieces per pound or hundredweight, wherever shown, are only approximate and cannot be guaranteed.

2. *Ownership of Tools*—Since our production machinery is all of our own design, our tool equipment is not adaptable to other plants. Moreover the tool charge specified applies only to the special tools necessary to supplement our large stock of present tool equipment. Except where otherwise specifically provided for, therefore, does not convey title to the tools or the right to remove them from our possession. However, there will be no further charge for repairs, renewals, or maintenance as long as the tools are in active use, provided that we may dispose of such tools after a lapse of two years without a reorder.

Use Hot Rolled Steel

3. *Finish*—Unless otherwise specified, the products shall be manufactured from plain, hot-rolled steel. Prices of plated parts include the commercial coatings available. Where special specifications are required including special thickness, special degree of immunization from corrosion, or any special tests, an extra charge will be made.

4. *Minimum Charges*—Our minimum charge is $1.00 per item of standard washers and $3.50 for special washers and stampings. All quotations are based upon the quantity specified or a greater quantity and for shipment at one time and in one shipment. If a smaller quantity is ordered or if split shipments are required, there will be an additional charge.

5. *Cancellations*—Orders entered on our books cannot be countermanded or deliveries deferred except with our consent and upon terms that will indemnify us against all loss.

6. *Time Limit*—Any unfilled portion of any order may, at our option, be shipped complete in six (6) months after date of order, unless otherwise agreed in writing. Such shipments will be invoiced in the regular way, and the buyer agrees to accept such shipments and the invoices covering same, and to render payment in full within thirty (30) days from date of such invoices.

7. *Changes*—If there is any loss or increased cost resulting from a change in quantity, specified deliveries, design, or specifications, such changes will be at the buyer's expense.

(a) *Loss*—All materials are sold f.o.b. Milwaukee, and our responsibility ends upon delivery to the first carrier. All claims for loss, damage, or non-delivery must be rendered by the consignee against the transportation company.

Claims in Writing

(b) *Shortage or Defective Material*—Claims for shortage or defects will not be considered unless made in writing within ten (10) days after receipt of material, accompanied by reference to our packing ticket number. After receipt of any claim that the material is not in accordance with the specifications, we shall have a reasonable time to examine the material claimed to be defective, and at our option we shall repair, replace, or make proper allowance for any materials which in our best judgment do not comply with the specifications. In no case shall we be responsible, however, beyond such repair, replacement, or allowance, in any manner whatsoever nor for direct or consequential damages arising out of the use, handling, or possession of any materials furnished by us. No such notice having been received by us within the time stated or if the buyer shall use such materials, the materials shall be considered as accepted by the buyer and as being in all respects in compliance with the specifications. We shall not be responsible for the labor of handling, inspecting, or sorting defective materials and same shall not be returned or destroyed without our written consent.

9. *Over and Under Shipments*—Since it is not practical from a manufacturing standpoint to make special goods in exact quantities, we reserve the right to overship or undership specified quantity within ten per cent (10%).

10. *Freight Allowance*—Freight is allowed on all washer shipments of 400 pounds or over at the lowest transportation rate available. Where buyer requests shipment by a faster or different route, freight allowance will still be based upon the lowest rate. As a condition of granting the freight allowance the buyer agrees to forward the paid freight bill to us for auditing as soon as it is received.

11. *Not Responsible for Design*—We extend to our customers engineering service in redesigning their product to facilitate the use of stampings, but, being manufacturers of parts only, we assume no responsibility for the design of any product or its fitness for any intended purpose.

12. *Patent Infringement*—Our acceptance of an order is upon the expressed condition that the buyer agrees to indemnify us against any

and all suits and claims for infringement of patents owned by other parties because of our manufacturing the parts covered by the order. Upon notice from us the buyer agrees forthwith to intervene and render all necessary aid in the premesis and to save us harmless against all loss, damage, or expense on account of such claim or suit. Furthermore the buyer agrees within ten (10) days of receipt of written notice from us to furnish bond in an amount and with surety acceptable to us for

the full and faithful performance of this clause.

13. *Delivery Promises*—Delivery promises are based upon our best judgment, and we will do our utmost to fill orders at the agreed time. However, delivery promises are contingent upon receipt of raw materials, fires, strikes, accidents, or other acts or causes beyond our control, and we will not be responsible for later deliveries for whatever cause.

14. *Samples*—Unless otherwise noted, our price does not include submitting a sample to the buyer before beginning production, and where this is required, an extra charge will be made to cover the extra set-up necessary. Delivery promises will be based upon receipt of buyer's approval of the sample, taking into account production schedules at that time.

15. *Additional Taxes*—The prices quoted are for immediate acceptance, and are subject to change without notice up to the time of receiving the buyer's order and are further subject to the addition thereto and payment by the buyer or any taxes or additional cost due to federal or state legislation.

16. *Rights Reserved*—We reserve the right to modify or refuse any of the prices or discounts quoted when we are satisfied they are not legally justified.

17. *General*—Stenographical and clerical errors are subject to correction. All quotations are made conditional on a financial standing satisfactory to us. The acceptance of each order, release, or contract is subject to the approval of an executive officer at our Milwaukee office, and all orders or contracts shall be governed by the laws of Wisconsin. This instrument together with any prints or specifications contains the entire agreement between the parties, and it is expressly understood and agreed that no promises, provisions, terms, warranties, conditions, guaranties, or obligations whatsoever either express or implied, other than herein set forth, shall be binding upon either party.

Condition No. 16 has a legal significance in view of the Robinson-Patman price discrimination law. This provision prevents someone other than the person for whom the quotation was intended from claiming it is an offer to anyone.

Advise the Customer

In accepting an order it is just as important to advise the customer the conditions under which it is accepted as when quoting. Consequently regular acknowledgment forms should be prepared for acknowledging all orders. Obviously the conditions to appear on the back of the acknowledgment should be consistent with those on the back of the quotation form. However, there certainly is no use in telling the customer how to order when you are accepting his order. Therefore ordering instructions should be omitted from the acknowledgment.

Certain other changes are necessary in the acknowledgment. For example it was necessary to change the wording of only three of the conditions reproduced above as adopted by the Wrought Washer Mfg. Co. The wording of these sections used for the acknowledgment forms reads as follows:

4. *Minimum Charges*—Our minimum charge is $1.00 per item of standard washers and $3.50 for special washers and stampings. All prices are based upon the quantity specified or a greater quantity and for shipment in one time and in one shipment. If split shipments are required, there will be an additional charge.

15. *Additional Taxes*—The prices shown are subject to the addition thereto and payment by the buyer of any taxes or additional cost due to federal or state legislation.

Governed by Law

17. *General*—Stenographical and clerical errors are subject to correction. All orders or contracts shall be governed by the laws of Wisconsin. This instrument together with any prints or specifications contains the entire agreement between the parties, and it is expressly understood and agreed that no promises, provisions, terms, warranties, conditions, guaranties, or obligations, whatsoever either express or implied, other than herein set forth, shall be binding upon either party.

Some trade associations have had foresight enough to adopt standard quotation forms and acknowledgments for their entire industry. It is believed that more associations will do likewise in the near future.

In presenting the specimen conditions reproduced here, credit should be given to the Milwaukee Stamping Co., Milwaukee, which has had a carefully drawn quotation form in use for many years, the wording of which was suggestive of many of the conditions adopted. During the days of the N. R. A., the Pressed Metal institute attempted to get the Milwaukee Stamping Co. conditions adopted by the entire stamping industry, but the project fell through with the death of the institute, and they were never adopted.

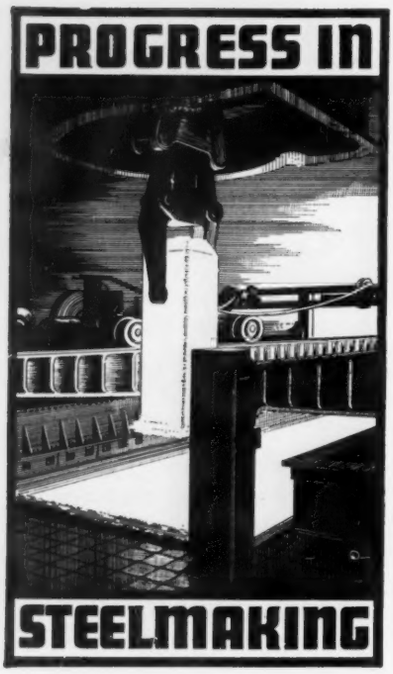
•

Diameters Increased

■ Fiber lagging with improved clamp is being introduced by Rockwood Mfg. Co., 1801 English avenue, Indianapolis, to increase the diameter of pulleys and speed of pulley belt.

Some of the advantages claimed include prolongation of belt life, elimination of the danger of burning out bearings and increasing the capacity of the driven machine.

Laggings are made of same material employed in paper pulleys. Compressed end grain fiber belt surface makes a pulling surface that grips and pulls belt without slip. They are applied by clamping on the wheel rim.



Maintenance

The oxyacetylene process is an indispensable tool in steel plants. Removal of salamanders, surface conditioning of billets, blooms and slabs are among its important applications

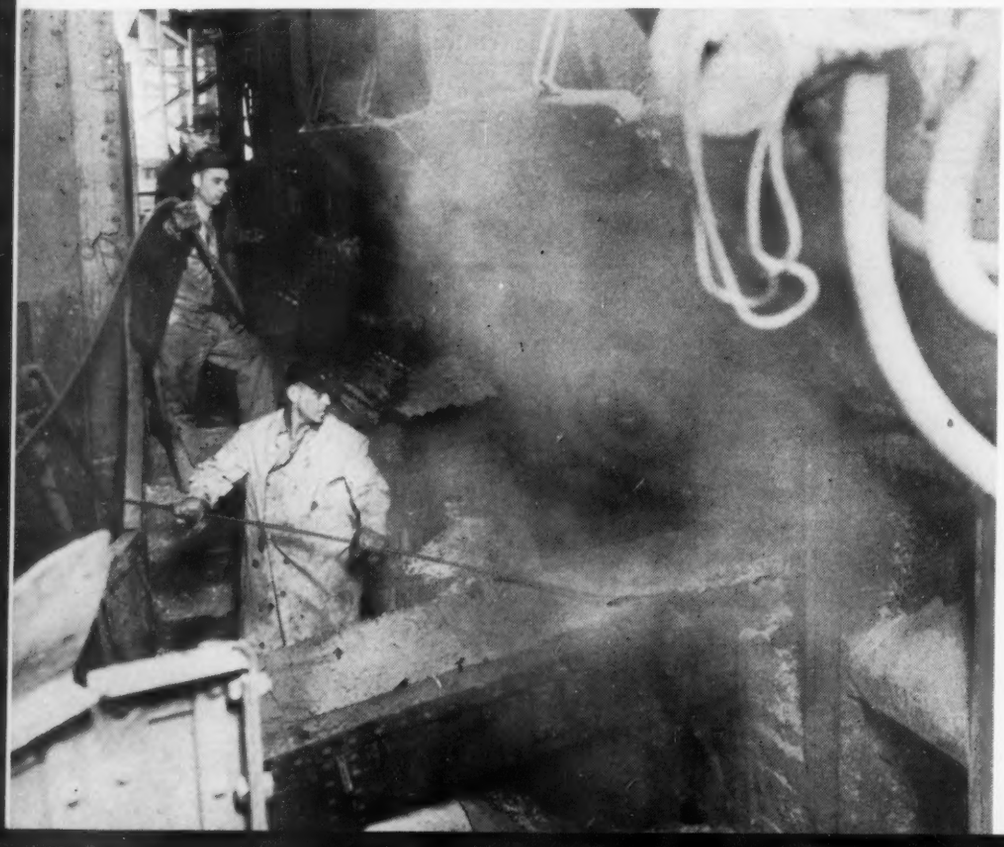
By W. J. SANNEMANN*
Service metallurgist, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

■ ECONOMIC OPERATION of steel mills is dependent to a great extent upon the element of time, and this, along with the production of quality products, is the determining factor in successful mill management. Machinery fails due to wear and fatigue without giving any advance notice and when such condition arises it is vitally essential to have tools at hand that will expedite the repairs.

In this the oxyacetylene process ranks at the top, due to its twofold function of removing the affected or damaged parts and then providing the medium through which the repair is made by the welding on of metal of suitable composition. This method of repair is not only adapted for speed of operation, but also permits work to be done without expensive removal to other locations. Use of this process for cutting purposes in steel mill operation is of great importance due to its wide range of application and time-saving operations.

Possibly one of the greatest time-saving uses occurs at the blast furnace in the removal of salamanders. It becomes necessary at times to blow out the furnace for relining and in so doing there remains below the iron notch an agglomeration of metallic material which must be removed in order to rebuild the hearth area. The old method for doing this work consisted of drilling with churn or hand drills, a process that was slow and tedious and required frequent sharpening of the drills. This was costly and great care had to be exercised in the selection of proper working materials. After the drilled hole was ready for shooting, small and carefully selected amounts of dynamite that would successfully break up this material for removal were first employed for the operation known as skinning out a cavity within the salamander. If the charge happened to be too heavy the hole would be blown, that is, the constricted area at the top would be opened up in such a manner that any charge regardless of the size would not have the downward force sufficient to break the salamander.

The present method consists of burning holes by means of the oxygen lance. This can be done in a remarkably short space of time.

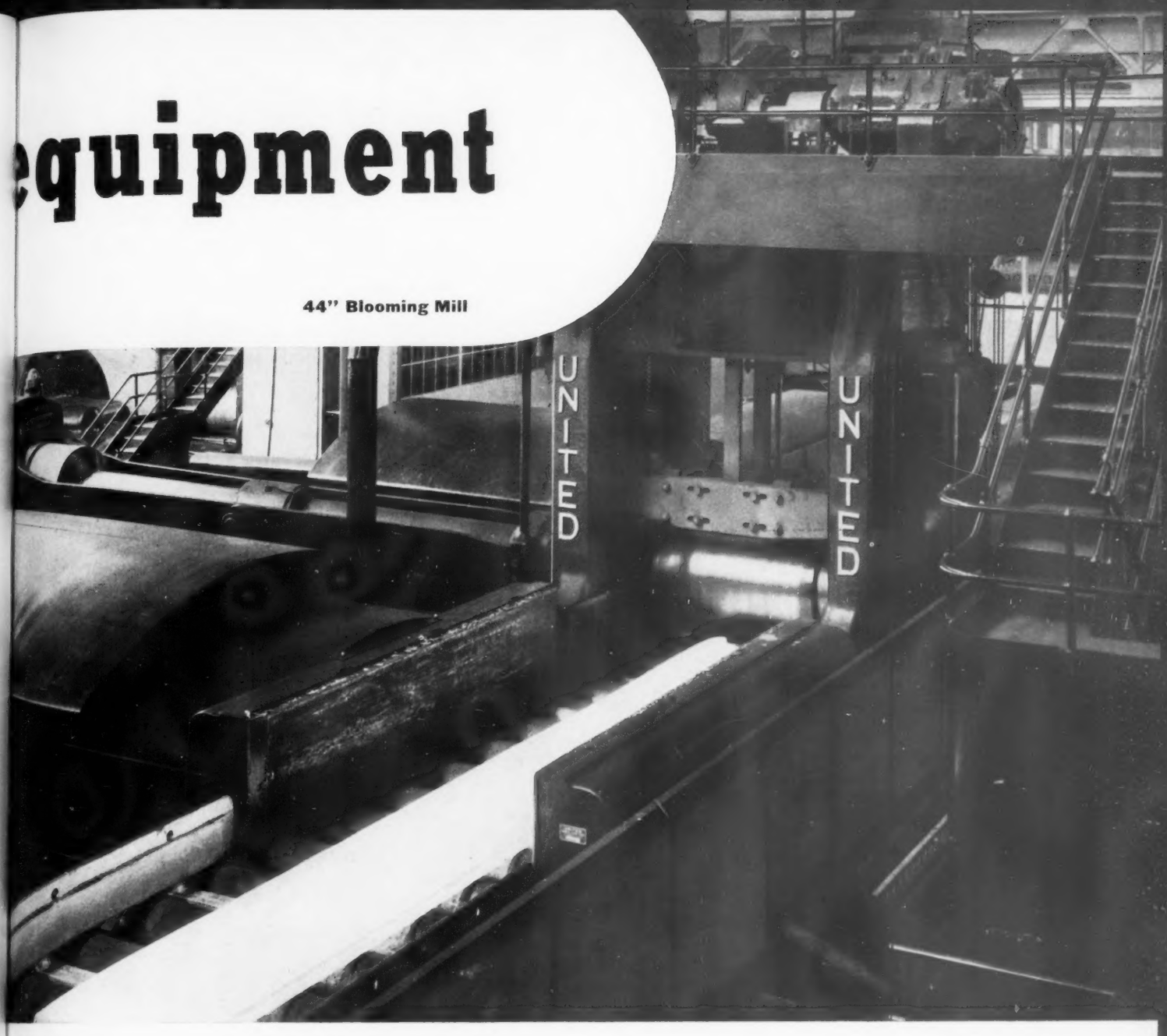


Opening tap hole of a stationary open-hearth furnace with the oxygen lance

*Mr. Sannemann presented this paper at the thirty-eighth annual meeting of the International Acetylene association, at Birmingham, Ala., Nov. 10-12, 1937.

equipment

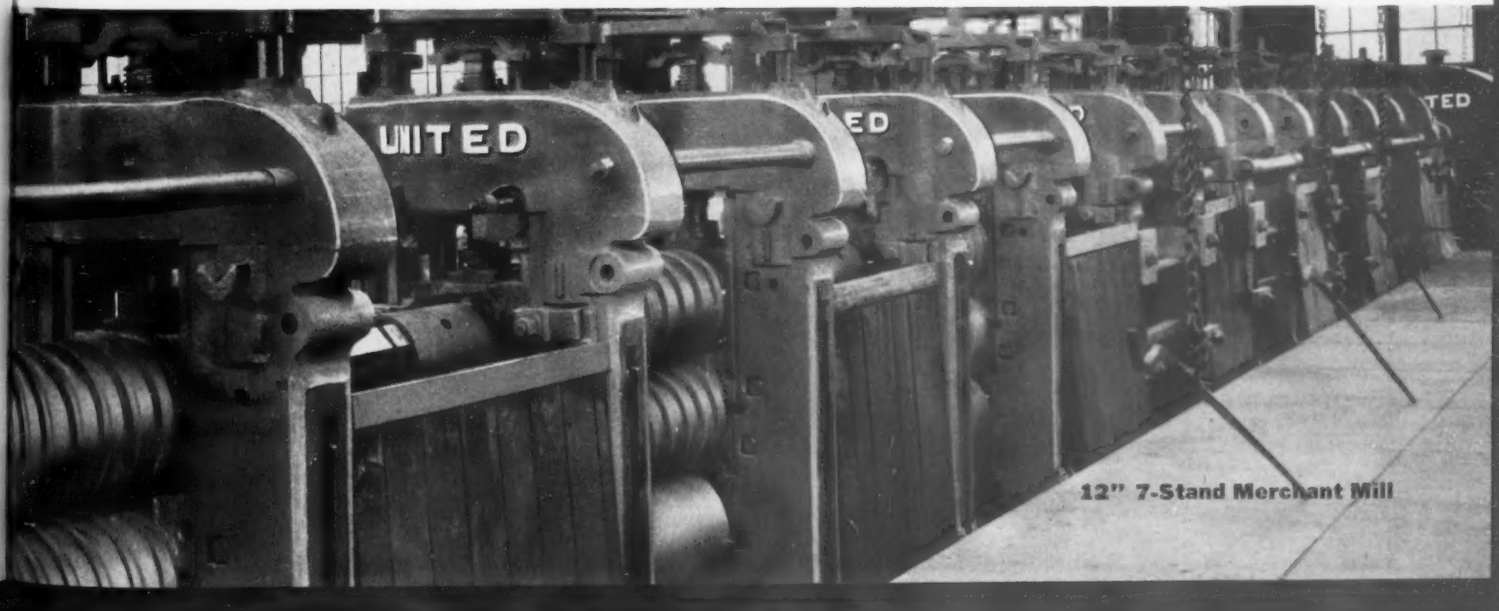
44" Blooming Mill



ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH · PENNSYLVANIA

ASSOCIATED COMPANIES: DAVY AND UNITED ENGINEERING COMPANY, LTD., SHEFFIELD, ENGLAND · DOMINION ENGINEERING WORKS, LTD., MONTREAL, P. Q.



12" 7-Stand Merchant Mill

Building up plate mill bearing through use of oxyacetylene flame and brass welding rod

The holes are burned to a depth sufficient to hold enough dynamite to break the salamander and the pressure of the gas is maintained sufficient to blow the molten metal of the salamander and the pipe out of the hole as the burning progresses. This factor necessitates a rigging that will permit a long line of burning-pipe to be used, as an interruption to tie on new pipe would permit a chilling of the hole, thereby presenting difficulties in starting again to say nothing of the economic questions involved. To overcome this feature, a string of pipes, sometimes as long as the height of the furnace stack itself is assembled and lowered by means of a sheave from the top of the furnace. As the pipe burns, a control from the outside permits the operator to use the pipe at any desired rate of burning as one continuous operation. This facilitates a rapid method which is of economic importance in steel mill management and for which no substitute has been found.

Depends On Size

The number of holes, of course, is dependent upon the size of the salamander, as it must be broken up into sizes that can be removed through limited openings with mechanical devices whose lifting powers are also limited. The depth of the hole is variable according to some authorities, but many contend that a maximum depth of about 30 inches is the limit for economic cutting, as the molten metal has to be blown out by the pressure of the gas and the deeper holes would increase the gas cost and defeat the purpose of this process. Recently a salamander was removed from a furnace taken off for repairs, and to give some idea of the value of oxygen in this operation it may be well to point out that 25 holes were burned in a period of 20 hours. The salamander, which is shaped somewhat like a saucer, measured approximately 5 feet thick in the center, had 26-foot diameter and weighed about 275 tons. Only one shooting of the holes was necessary to break up this material in sizes convenient for removal from the furnace.

Skulling of ladles is another use for oxygen that is worked advantageously around the blast furnace for speedy removal of iron skulls in transfer ladles. While these are some of the outstanding uses in this department, they are by no means the only ones, for in such uses as rivet cutting, pipe welding, removal of spills from slag pots, preparation of slag pots for welding and general construction, the oxyacetylene process has a most important role and must be considered a permanent tool in maintenance work.

The fabricating and welding department possibly uses the oxyacetylene process for more applications than any other branch of the steel mill both for cutting and welding. One application that is of interest is the oxyacetylene machine cutting of different shapes from heavy rolled plates. This in many instances offers a considerable saving due to the fact that certain vessels and structures can be cut and fabricated from rolled products instead of producing the same as a casting, which would have to be machined and in many instances be given a heat treatment to remove casting strains. This feature can be readily appreciated when we see that the most intricate designs can be cut rapidly without the attendant danger of losing a casting as sometimes happens in foundry practice. Many other shapes are produced in the same manner that eliminate forging and machining operations, thereby reducing costs. The bronze welding of broken castings salvages many pieces of machinery and turns them back into the line of operation in a minimum length of time. Lately the cutting and welding of steel pipe has become standard practice and this too, with its elimination of a threading operation permitting easier assembly, has materially lowered maintenance costs.

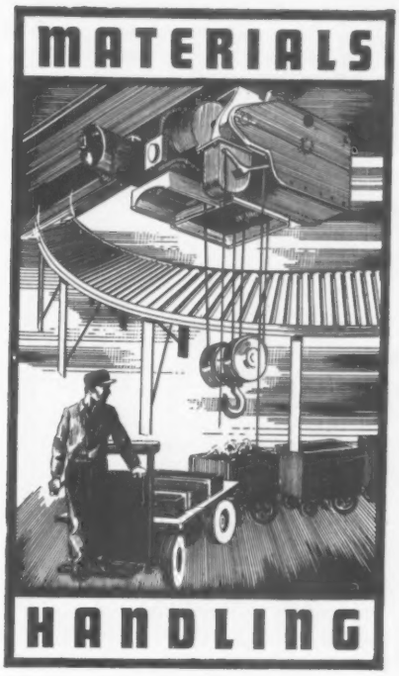
Rods Used Extensively

Building up of worn parts with suitable abrasion-resisting welding rods has made rapid strides, particularly in the replacement of mill guides. A recent application of this on twist guides showed 10 times the ordinary life of a chill guide and even then this did not mean scrapping the guide, as would have been the case with a chill guide, but merely the building up of more weld metal for further use. Other guides have been treated in a similar manner and in each case increased life was obtained with a lowering of operating costs. Many other uses for gas welding, such as assembling tuyeres, monkeys and blocks for the blast furnace, fabricating of burners from pipe and the preparation of tank plates by cutting are made in this department.

In a great many instances appli-

(*Please turn to Page* 60)

Tipping skull-cracker bucket teeth with abrasion-resisting welding rod and oxyacetylene flame



New Trucks

Ingenious designs have been required for ram trucks for use in handling coils of wide strip steel. Two of the latest type are now used by Great Lakes Steel Corp.

J. A. CRONIN, Materials Handling Editor

■ EFFICIENT truck handling of wide, welded-type coils of strip steel ranging up to 20,000 and 30,000 pounds in weight and 84 to 96 inches wide, has called upon builders of electric trucks for new ingenuity in designs. Two of the latest types of such trucks are now in operation at the plant of Great Lakes Steel Corp., Detroit, handling wide coils from storage to the cold reduction mills and back to storage again.

These new ram-type tractors are of the center-control gas-electric type and feature two significant innovations in truck design — exceptionally short wheelbase and overall length for their capacity, and a combination drive unit and motorized steering turntable on the rear wheels. The latter feature is claimed to be a radical departure from the conventional-type drive used in industrial trucks and does away with tire drag, pinching or crowding, whether the tractor is standing still or in motion with maximum load.

Length Kept Short

Wheelbase has been held to 90 inches, with a turning radius of 125 inches and overall length to permit operation of the unit in a right-angle aisle of 139¼ inches. Handling coils up to 30,000 pounds in weight, the tractor has a maximum rating up to 1,125,000 inch-pounds.

Construction of the drive unit is particularly interesting, comprising a double-reduction, spur gear transmission powered through a heavy-duty motor. Power is transmitted through extra wide-faced, heat-treated, chrome-nickel steel gears and pinions mounted on shafts with self-aligning ball bearings. Extra large diameter, chrome-nickel steel, full-floating drive axles with splined ends are used, heat treated for high tensile strength and driving torque. The complete drive unit is mounted on the steering turntable, with a pivoted connection for fully equalized traction, to compensate for uneven runways and to relieve the main frame from torsional strains or stresses.

The motorized turntable mechanism combined with the drive unit is a self-contained and completely enclosed gear unit, powered by a separate motor and controlled from the operator's station by remote power steer, without any steering rods, joints or connections.

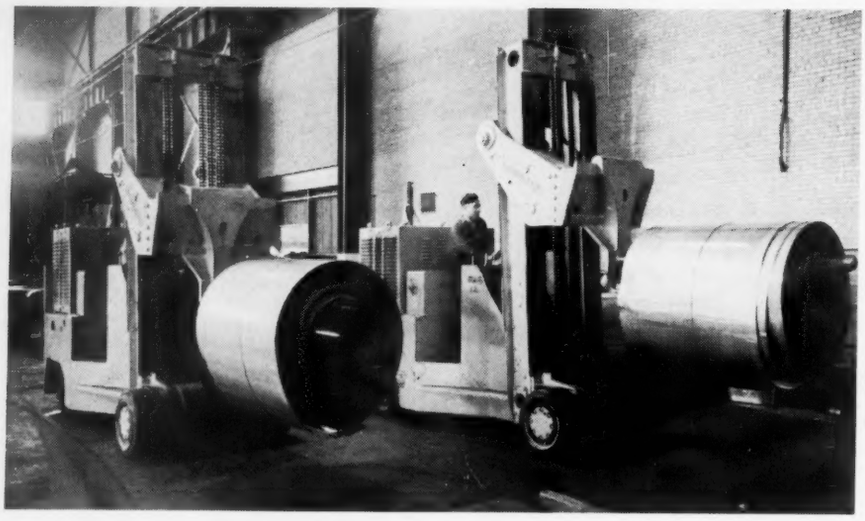
Arrangement of the front or load wheels also is unusual. Mounted four abreast, they permit a more compact chassis construction and eliminate the necessity for articulated frame construction or tandem mounted axles. Likewise this method allows the use of larger diameter wheels with wider tires, providing in effect a straight line of rubber across the 48-inch width of the tractor front. Wheels, tires and wheel bearings are fully interchangeable.

An all-steel frame is fabricated into one unit by hot riveting and welding. One-piece heavy-section rolled steel plates form the main side body, these being riveted and welded to supplementary members such as rear bumper and cast alloy steel axle members.

Add to Stability

Inclined tiering uprights are designed to contribute to stability, maximum traction and compactness. They are heavy H-section columns faced with machined plates upon which the ram carriage travels. Columns are

These two new gas-electric trucks handle wide coils of strip steel weighing up to 30,000 pounds to and from storage and cold rolling mill



Short wheelbase, power steering of rear wheels, four wide front wheels and center control platform are some of the features of these ram trucks making for flexibility and maneuverability

housed in the main frame to assure rigidity and alignment under maximum load stresses, both laterally and longitudinally.

Carriage upon which the ram is attached is a massive alloy steel casting mounted with two pairs of heavy section steel plate cantilevers, the latter fitted with wide-faced steel rollers mounted on large roller bearings with "Perma-sealed" lubrication. Hoisting and lowering are accomplished by two double-strand, alloy steel chains in two parts, operating from a lift unit powered by a motor through worm and spur gear transmission. Full limit control switches regulate the high and low positions with intermediate stopping or starting at the will of the operator.

Accompanying illustrations show the two new units in action in the Great Lakes plant, and give some conception of their sturdiness and compactness. The trucks were designed and built by Automatic Transportation Co., Chicago.

Use Crane for Laying Rails

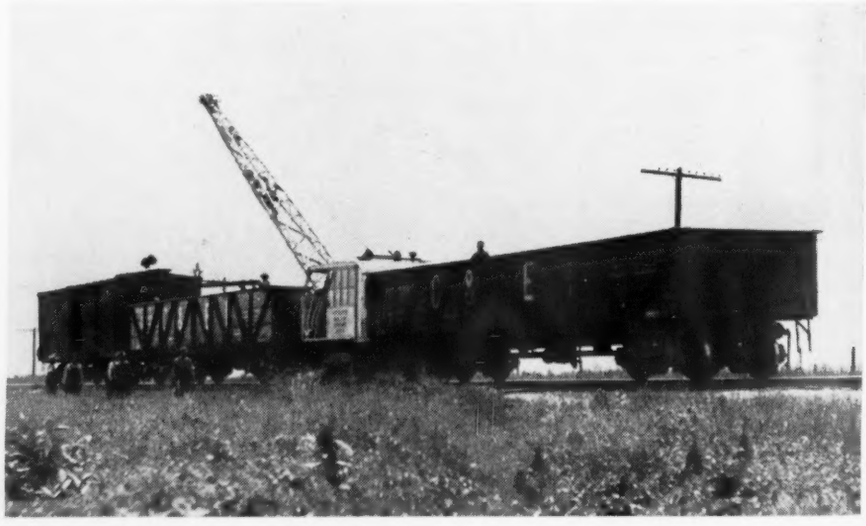
■ One comparatively recent innovation in materials handling operations for railroad maintenance work is for track relaying work.

As is generally known, rail in track must be renewed at intervals depending upon the amount of traffic over the line. The first operation in this work is the distribution of new rail, which is unloaded piece by piece along the right of way as far as the replacement job goes.

The rail gang then changes out the old rail and puts in the new. The former is set to one side along the right of way in approximately the same position as was the new rail when it was unloaded. It is then necessary to pick up the old rail, usually called changed out rail. Ordinarily, what is classed as a work train, consisting of a locomotive and a number of cars, is used for this purpose.

The new method employs a full revolving crane mounted on 4-wheel railroad truck. In a recent check of operations with one such crane, it is reported that in an average day of work approximately 500 lengths of rail, or four carloads, were loaded. The rail was 90-pound, 33-foot long. The crane had to switch five times during the day to clear for oncoming trains. The crane not only does the loading and unloading, but also acts as locomotive for the freight cars which contain the rails. The crane is equipped with automatic air brakes and has sufficient power to pull two loaded cars on straight track approximately level at 15 miles per hour.

In addition to unloading new rails, this crane picks up and loads the old rails, and also does the hauling and switching jobs



Moving Tote Boxes

■ Common practice for moving toteboxes short distances, as from one machine to the next, is to drag across the floor with a hook. On concrete floors the bottom of the box wears rapidly. In one plant the bottom and lower edge is reinforced by two 1-inch angles with flat side down and turned up at the ends, which serve as sled runners to take the wear. These runners are easily replaced when the countersunk rivet heads wear off.

For moving longer distances the tote boxes are dragged onto the platform of a hand scoop truck. The angle-iron reinforcement also takes the wear as the tote boxes are slid in or out of a steel storage rack from a hand-lift tiering machine. This stores the 10 x 15 x 24-inch boxes seven tiers high from both sides of the rack.

To prevent excessive wear in the floor in front of the rack, wheels run on two ½ x 6-inch steel plates with ¾-inch angles riveted to the two outer edges to make a track. The tiering machine may be removed from the track at either end for use elsewhere.

Special Counting Unit

■ In one plant where large quantities of incoming parts and finished items are to be counted a special counting unit has been designed. The finished product is relatively

(*Please turn to Page* 83)

HOW STRONG IS *Steel?*

"How strong is steel?" is like asking: how strong is an elephant? No one knows until it has been tested or exerted to the limit. It is the business of this Armco Research worker to find out. That he comes up with the right answer every time attests both to his skill and the modern equipment with which he works. Armco Research not only creates new and more useful metals, but it also helps customers make the most of their investment in Armco metals — an important task. ☛ We invite you to share in this helpful technical service. The American Rolling Mill Company, 1090 Curtis Street, Middletown, Ohio.

ARMCO METALS ARMCO **BORN OF RESEARCH**

Maintenance

(*Concluded from Page* 54)

cations of the oxyacetylene process are identical in the mills. In some cases certain uses are outstanding for economic reasons. For example, all mills experience cobbling at one time or another, particularly when changing sections, which calls for a complete realignment. In this instance the use of the oxyacetylene process as a cutting agent becomes invaluable in reducing delays by enabling quick removal of the cobbled section.

In recent years the surface conditioning of blooms, billets and slabs has become mandatory in the production of certain materials that must have a superior surface finish. This calls for the removal of imperfections no matter how small, sometimes necessitating complete skinning of these sections. The oxyacetylene torch with certain tips has been used satisfactorily in this operation supplanting to a certain extent the orthodox method of conditioning; this is because it has proved much faster and decidedly more economical. The operator, however, must be an experienced one in this line of work as several conditions could arise that would make the worked section unfit for further rolling.

Under this classification the scarfing test could probably be mentioned as it is of somewhat similar character, but the final results give an entirely different answer. The first is for surface conditioning, while the second one is for determining the internal soundness of the rolled section. This second test conducted in the billet yard is also rapid and replaces the expensive method of cutting, machining and etching the section to determine the soundness of the internal structure.

Plates too heavy to be sheared at the plate mill offer the apportunity for gas cutting these items at a low cost. Circles and semicircles are readily produced, even in the thinner sections, thereby reducing the time and labor that would be encountered in shearing under straight blade shears. These operations are carried out by means of a cutting machine.

In the open hearth department the oxygen lance serves a useful purpose in opening tap holes in stationary open hearth furnaces. This greatly speeds up the opening of the hole, in that piercing with the lance permits the rod used as a punch from the front of the furnace to act also as a reamer, thereby producing a smooth, even, tapping stream. This, though it may seem odd, is considered by far a safer method of opening a tap hole. The old way of using a pricker bar, in some cases, caused painful burns to the helper whose duty it was to open the hole. In this phase of the operation the element of time is an essential item, so it is important, when necessity demands that a furnace be taken off for repairs, that all possible speed be utilized in shortening this period of idleness. The cutting torch answers this need by quickly dismantling the members to be removed in making the repairs. Other uses, such as welding and cutting of furnace doors in fabrication, cutting of scrap to charging box size, removing iron and steel skulls from ladles and spouts and the cutting of salamanders with the oxygen lance are within the wide range of application of this industrial tool.

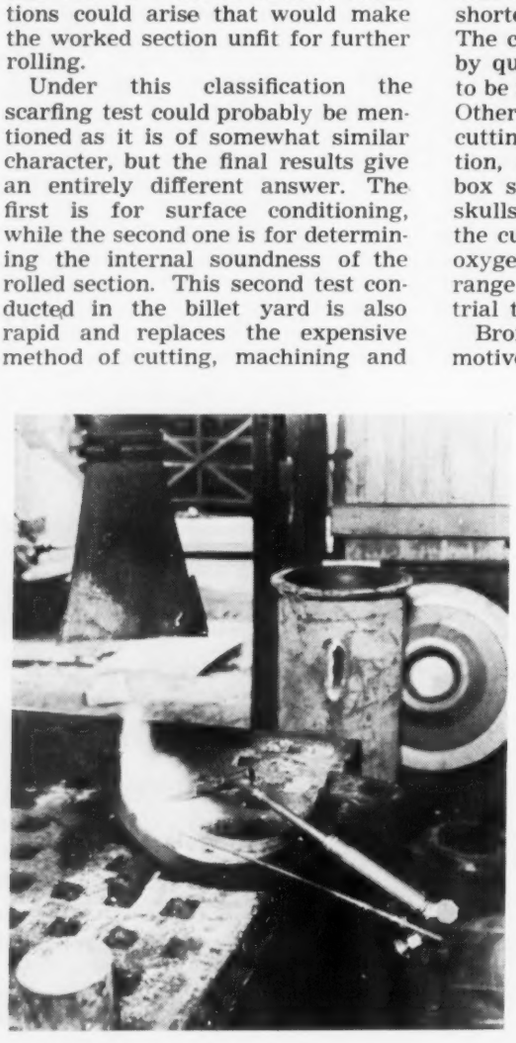
Bronze welding of cast iron locomotive cylinders by means of the oxyacetylene process shows a great saving in this branch of operation and many are reclaimed that otherwise would have been scrapped as unfit for further use. Also, repair of coupling boxes and knuckles through this same medium has effected a good saving.

This is especially true of the knuckles subjected to rigid government inspection that specifies the clearance opening. By building up this part of the coupling assembly many are saved which would otherwise be scrapped. The welding of fireboxes is successfully carried out, care being taken that the welded area is always below the water line. The building up of various worn parts such as driving box liners for shoe and wedge faces offers further an opportunity for the utilization of this process. Grate bars repaired by welding have lowered the cost of maintenance in this department. Dismantling of cars for repairing and scrapping is effectively and quickly done by the oxyacetylene torch.

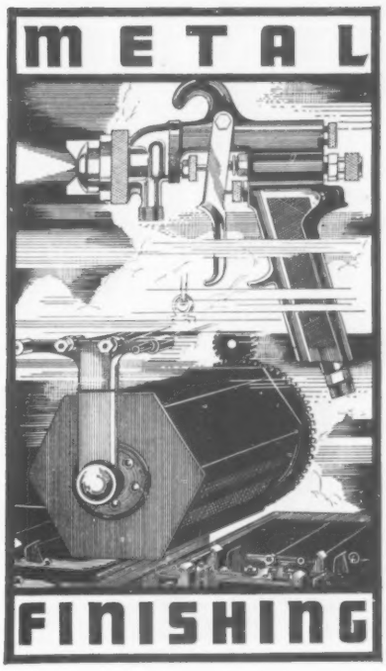
Value Realized

Pipe shop, machine shop, forge shop and electrical shop all realize the importance and value of having oxygen and acetylene available when certain conditions of repair and fabrication arise that demand an economical operation. A few of the applications give some idea of the scope of work done: Pipe cutting and beveling with a special oxyacetylene machine; fabrication of fittings and headers; pipe welding; bronze welding of motor cases and frames; building up crane contact shoes; cutting mill guides, machine parts and gear blanks; removing risers from castings; tipping machine tools.

Another use for oxygen practiced in many shops is the shrinking-on of bushings and the like by the use of liquid oxygen. On this operation the liquid oxygen must be handled carefully to avoid any possibility of a mishap. Advantage of the use of this method over the old method of expansion by the use of heat is not hard to realize when it is considered that an excess of heat can probably cause a complete change in structure that would be detrimental to the material itself and probably be a contributory cause to early or immediate failure. The contraction, which in most cases calls for only a few thousandths of an inch, is rapidly obtained by immersion in liquid oxygen and upon attaining atmospheric temperature will cause a tight fit through the attendant expansion. At the present time there is an economical limit to the size of sections that can be successfully handled by this method.



Building up back half, eccentric strap with oxyacetylene flame and bronze welding rod. In background is dumping cylinder prepared for repair with bronze welding rod



Improved Practice

New finishes and the new methods of application play important parts in the retention of life and lustre in finishing Ford and Lincoln-Zephyr automobiles

■ FOR SOME YEARS, Ford Motor Co. chemists have been experimenting with various synthetic resins, or enamels, for use in finishing motor car bodies. One of the difficulties was to obtain a proper thinner for use in spraying the enamel on metal surfaces. This was recently solved in removing a high solvency naptha from kerosene which had been found to cause a crust to develop on the wicks when kerosene was burned in oil lamps. This particular high solvency naptha proved to be just the material needed to thin the new enamel.

Used on all Ford V-8 cars and trucks as well as Lincoln-Zephyrs, the new finish has shown an exceedingly long life compared to any other finish available. This synthetic resin, related chemically to some of the plastics now widely used in industry, is a glycerol-phthalate made up of glycerine and phthalate which comes from coal tar naphthalene as phthalic acid anhydride. Neither are in any sense resinous but are synthetized with soya bean and china wood oil to a resin.

Weeks to Apply

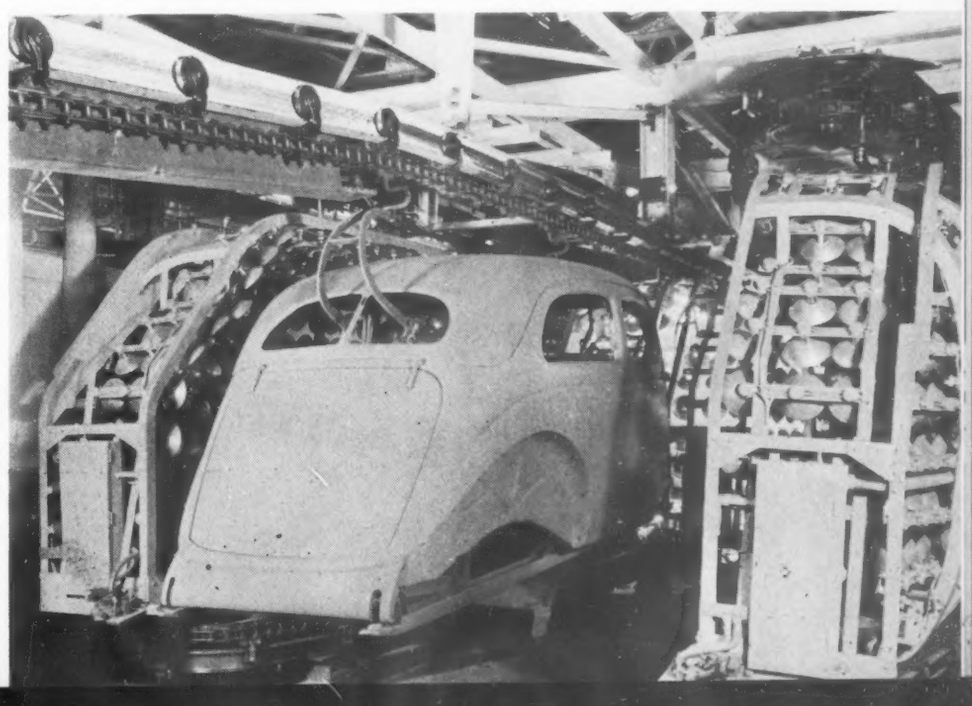
According to J. L. McCloud, Ford Motor Co., automobile finishes once took weeks to apply and then only remained brilliant for a few weeks. Later nitro-cellulose lacquers that could be applied in a few hours were introduced. They lasted several months before they began to fail by chalking, Mr. McCloud said. He added: "The last change in the finish of cars is to synthetic resins. Improvement is again obtained in the time of application, the principle improvement, however, being in the increased durability. The time is still measured in hours to apply but the life is to be measured in years, rather than weeks or months as was done formerly."

Base, thinners and pigments used in the enamel are all new. Thinner and base have been described above. Pigments for white are titanium oxide and antimony oxide, the first for opacity and the second for low rate of dulling. Of the greens, many are made of yellow oxide of orin with white and black (which makes a bluish grey) rather than chrome greens. For blues, iron cyanides are used when dark, and organic lakes or color pigments in light tints. Maroon pigments now also have a life equal to any color. Many colors such as red formerly had poor durability whereas actual experience as well as laboratory tests indicate the new finish will retain its original lustre for years with nothing more than an occasional polishing.

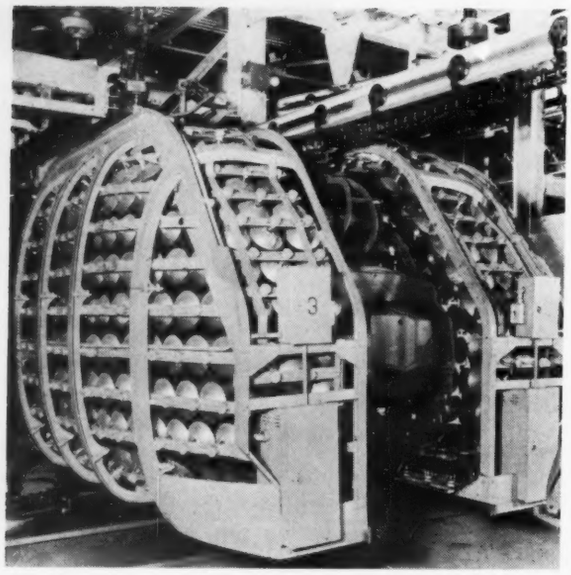
Some Parts Dipped

The new enamel is sprayed on bodies and is applied to some small parts by dipping, a new development in application of colored enamels to surfaces requiring a high lustre.

One of the features of the advanced finishing methods now employed with the new enamel is the equipment and procedure used for baking on the successive coats. The bodies travel on an overhead conveyor, are sprayed and then are baked between two synchronized



Clamshells containing infra-red heat lamps travel on short conveyor sections parallel to main conveyor carrying auto bodies. Here clamshells are about to close around body



Closeup of body emerging from drying section with clamshells beginning to open from around body

conveyors on which are frames with a large number of infra-red lamps with suitable reflectors. As the body moves along the conveyor line, the powerful batteries of heat lamps move along with them directing their rays on the enameled surfaces and raising their temperature to a point where seven minutes exposure completes the baking. After traveling with the body for this period, the batteries of heat lamps follow their conveyors back to the point on the line where they enclose another body and dry it. One of the accompanying illustrations shows a body as it enters the conveyor section carrying the heat lamps which at this point have not yet closed around the body. The second illustration reveals the body enclosed by the heat lamps and just on the point of emerging from the seven minute baking operation.

The method described develops heat at the surface of the metal, right where it is wanted. Heat lamps are shut off on their return trip to the main conveyor line where they are again energized.

After spray application of the final coat, the bodies are baked at precisely 250 degrees Fahr. for one hour in an oven and then are subjected to another rigid scrutiny before moving onto the trim line.

Rust Proofing Process For Pipe Is Developed

■For many years, steel and iron pipe for general purpose use as well as for electrical conduit has been coated by the hot galvanizing process to form a protective, rust-resisting layer over the metal. Usual practice is to thread after galvanizing as if the threads were cut prior to coating they would be filled with the zinc.

In an attempt to protect the threads, painting or lacquering has been resorted to but this has not proved satisfactory for pipe used as electrical conduit as imperfect electrical contact is produced at joints whose threads are so treated.

A recent invention, now being used by Enameled Metals Co., Pittsburgh, has successfully overcome these difficulties. Merchant pipe and electrical conduit first are treated by hot galvanizing, then threading desired portions and finally using a new process for application of zinc to the threaded sections by cold galvanizing. It is said that a perfect thread is produced and that joints have full electrical conductivity.

The process has been used for two years in the production of rigid steel conduit and protected threads are being specified by many engineers and other agencies as this process becomes more widely known. Enameled Metal Co. expects that soon it will be standard practice to coat the threads of all couplings and other fittings by this or some similar process in order to protect the threads.

Porcelain Enameled Steel Fireplace

This new development creating considerable interest among architects and builders was recently announced by Porcelain Enamels Corp., Louisville, Ky. Face and hearth of this fireplace are of porcelain enameled steel

New Temporary Protective Coating Is Developed

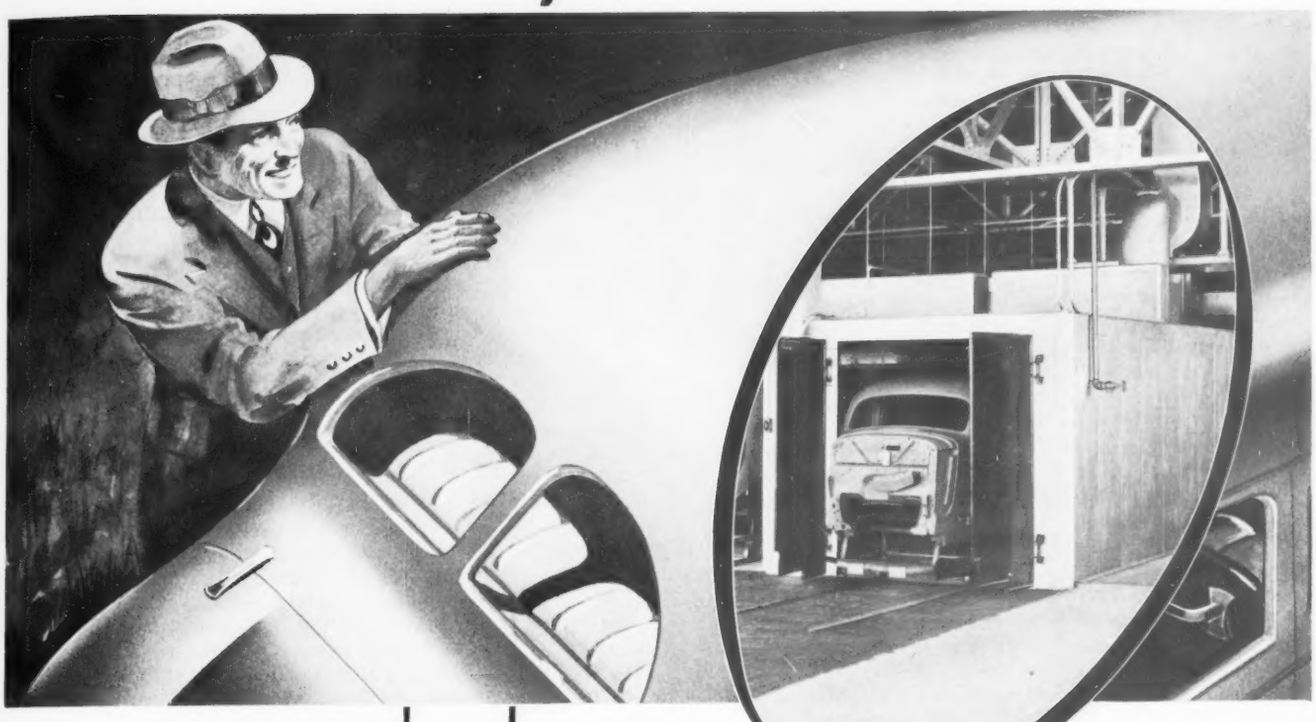
■ Haydn F. White & Co., Cleveland, has introduced a product described as a temporary protective coating for highly finished surfaces during fabrication, shipment or installation. Called "Protex," it is applied by dipping, spraying or brushing to form a thin, tough, elastic film which is either covered with paper or dusted to eliminate tackiness. It readily peels off for quick removal. It is available for various types of highly finished metal and painted or varnished surfaces.

Aluminum Coated Steel

■ A1-Plate is the trade name of an aluminum coated steel now commercially available under a patent owned by Colin G. Fink, 119th street at Broadway, New York. It can be drawn, has tensile strength equal to the base metal and the surface will take a mirror finish that will last indefinitely at ordinary temperatures, it is claimed.

Surface also can be dyed red, blue, green and other colors, the process consisting of anodically attacking the surface in a weak acid solution and passing the sheet through a bath. Subsequently, parts can be formed with little injury to the color.

For that finish, mister...



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Welding of Pressure Vessels and Pipe Interests West Coast Conference

■ ONE of the important subjects considered at the western regional conference of the American Welding society in Los Angeles, March 21-25, during the third Western Metal congress and exposition, was welding of pressure vessels and large diameter hydraulic pipe. Another topic of interest was welding of cast iron. A summary of discussion on these subjects is presented herewith and constitutes the concluding report of the western conference. Reviews of other phases of the meeting appeared in STEEL for March 28 and April 4.

Problems connected with welding pressure vessels and large hydraulic pipe occupied two sessions. Dr. W. F. Durand, Stanford university, opened these sessions with an informal discussion of various questions considered during development of a code for large welded steel pipe for hydraulic purposes. Many of these have to do with design; others with the steel and efficiency of the joint; all have importance in determining the thickness of pipe wall and the diameter, and these in turn are the most important items of cost.

Seek Higher Strengths

Present A. P. I.-A. S. M. E. codes for unfired pressure vessels limit carbon content in steel to 0.35 per cent. Since this also is the principal limitation on strength, it would be desirable to investigate this figure more seriously. Present trends in designing seem to be toward use of yield point rather than ultimate strength, in the formulas, and possibilities of increasing and stabilizing the yield point by minor alloying, by heat treatment or by cold work is a possibility holding considerable future promise. Such expected improvements in the metal, however, must not be lost through penalties and uncertainties of welding.

Present codes fix certain factors of "e", the efficiency of the joint, in a sliding scale depending on design of joint, grade of steel, and welding technique, and in combination give a possible range of values for "e" ranging from 60 to 95 per cent. It seems reasonable that for highest grade of steel, most effective type of joint stress relieved and radiographed, and where continued tests show 100 per cent strength, the code should admit of a value of 100 per cent for "e"—especially when the factor of safety is 2, based on yield point stress, and the location of the line is such that failure would cause little hazard to life or damage to property.

Welding Field Joints

A paper, "Design and Fabrication of High-Temperature and High-Pressure Piping," by F. C. Fantz, vice president, Midwest Piping & Supply Co., St. Louis, had to do primarily with field joints. The almost universal trend toward carbon-molybdenum steel, allowing a reduction of weight of about 40 per cent in this service, has required new welding techniques and stress relieving of all joints. The pipe line obviously should be prefabricated in the shop, leaving only the minimum number of field connections, because of steady work and special machinery available in the shop, and trained personnel engaged in the necessary auxiliary work of research, design and supervision.

Mr. Fantz is convinced that quality of joint as made either in field or shop, is due as much to capabilities of the process and excellence of supplies and equipment as to skill of the operator. Once procedure is set and checked, to prove that it can produce welds with the desired physical properties, it is then only necessary to train the welder in prescribed routine. When the welder has repeatedly proved his ability to carry out the procedure, and is properly supervised to make certain no essential is slighted, the result will be satisfactory and pass all reasonable tests.

Field joints are preferably butt welds on accurately chamfered pipe ends. Principal difficulty is with the first bead at the bottom of the vee—adequate penetration will put small globules of metal in the inside wall of the pipe, which cannot be removed completely by "turbine cleaners," and may later loosen and become lodged in a valve or elsewhere to do great damage. As a result of 15 years study of this problem, Mr. Fantz recommends a thin backing-up ring at each field joint. Both pipe ends are tapered inside at a 10-degree level, to fit over a corresponding bevel on the outer circumference of the backing-up ring.

The ring is about ⅛-inch thick at its center and made accurately enough that when the abutting pipes are thrust together the wedge surfaces hold the bottom of the vee apart the necessary distance so the first run can fuse together both of the end-lips to the backing-up ring. As the vee is completely filled and with moderate reinforcement, a 100 per cent joint is insured. Shrinkage due to welding is in two directions: 1. Longitudinal, to shorten the pipe; and 2. circumferential to constrict the diameter. Both of these actions tend to tighten the contact between backing-up strip and inner pipe wall.

Pipe Unusually Large

Manufacture of 11½-foot pipe for lines carrying water from the Colorado river to coast cities was described by Leroy A. Muffler, engineer, Consolidated Steel Corp., Los Angeles. Thickness of plate varied from 9/16 to 31/32-inch and was received in 100-inch widths, about 36 feet long—enough for the entire circumference. Edges were shot blasted and then machined to form the specified vee, and the plate rolled to an accurate circle (specifications calling for outside circumference to be within +0, —⅜-inch of its theoretical value). Steel used conformed to A. S. T. M. specifications A10-34 and A78-33.

Welding was on automatic units using the "Unionmelt" process. The longitudinal joint, first tack welded, was backed up with a water-cooled block to control penetration of weld metal and absorb surplus heat. Above, the vee was heaped with a powdered material which is an electrical insulator but becomes a relatively good conductor when molten. Into this the alloy steel electrode was fed continuously and the joint

built up by "resistance fusion" rather than "electric-arc" methods. The entire joint was filled at one pass, the melted powder becoming an efficient and protective flux, floating to the top of the joint and being readily detached. Short extension plates were tack welded on so that electrical conditions were well stabilized when the advancing puddle reached either the front or rear edge of the 100-inch plate.

Shipping lengths of pipe were 33 feet 4 inches, thus requiring four 100-inch "cans" and three circumferential joints. The latter were made by the same process as described, the electrode being fed vertically downward at a fixed point, under which the assembly slowly rotated. Exact alignment "can" to "can" was had by an internal spider, whose radial arms contain hydraulic jacks working against water cooled segments shaped to correct internal diameter.

Tested Following Anneal

Complete lengths then were bell-ended and stress relieved at 1150 degrees Fahr. for 1 hour per inch thickness. Each length was given a hydraulic test. For each 400 lineal feet of combined longitudinal and circumferential weld a test plate was attached and welded without interruption. Tension tests were then required to show a joint efficiency of at least 100 per cent of the parent metal. This they did; tensile strength developed by the weld metal was frequently over 60,000 pounds per square inch; elongations up to 50 per cent were not uncommon.

Finished pipe-lengths were coated internally and externally with a coal tar primer, and then coal tar enamel was applied by the spinning process. This method requires that the pipe be close to a circle and have no large irregularities at the joint, not only to prevent large centrifugal stresses while spinning but also to insure a uniformly thick coating of enamel. The exterior was further protected by a 1½-inch layer of "gunite" cement, reinforced by wire mesh.

Preliminary studies to determine corrosive character of the soil in which this pipe is buried, and the mode of protection, was described by H. P. Vail, engineer, distribution division, Metropolitan Water district, Los Angeles.

The second portion of the symposium had to do with closed vessels—actual pressure vessels—principally used in paper mills and petroleum refineries. That old bugaboo, "weld decay," was properly resurrected by Randolph Simpson, Electric Steel Foundry Co., Portland, Oreg., in his discussion of "Stainless Alloy Welded Plate and Castings in Corrosion Resisting Pressure Equipment." It is of course caused by changes in constitution of the alloy, by heat of welding, which render a zone on each side of a reheated zone more susceptible to corrosion. These changes are associated with the precipitation of sub-microscopic carbides, commonly suggested remedies are to limit the carbon to 0.07 per cent, or to fix it as a harmless inclusion with titanium.

In Mr. Simpson's experience, neither remedy is effective; a high temperature quench is still needed to put the precipitated carbides back into solution. (He has had no experience with stainless alloys containing columbium, either castings or rolled plates.) He said: "We have found that when low carbon 18-8 with molybdenum is used for our fabricated parts, our standard 18 chromium, 8 nickel, 3 per cent molybdenum analysis for castings and both given our regular heat treatment, they, separately or in combination, will withstand the most corrosive work with which we have to contend. The bulk of it is installed in sulphite paper pulp mills, and I very much doubt if there is any combination of the elements that go to make up stainless steels which will give the general satisfaction this material does in pumps, pipes, vessels, valves, heat interchangers and a multitude of fittings."

Mr. Simpson emphasized the necessity of smooth welds, free from tiny inclusions or pin holes. Such defects may mean nothing as far as strength is concerned, but represent centers of corrosion capable of serious damage. Coated welding rods of equivalent analysis to the base metal are available from several reliable sources, he said.

Take Nothing For Granted!

"Recognizing and Repairing Weaknesses in Existing Pressure Vessels" was the title of a paper by K. V. King and F. T. Patton, Standard Oil Co. of California, San Francisco. Their motto, particularly when getting an old vessel ready for a new use, is to take nothing for granted! Even when drawings are in existence purporting to show the construction in minutest detail, all the dimensions must be checked by accurate measurements of the existing vessel. Outside contours, particularly at dished ends and knuckles, are especially critical, and must be determined by cutting a templet to fit and then measuring the templet. Effects of corrosion must be investigated by painstaking examination inside the vessel; a sample of any inaccessible tubes should be removed; thicknesses checked by drill holes.

When actual size and shape of vessel are known, working stresses in the new duty may sometimes be figured accurately. Recommended allowances made for existing welds are:

Sound oxyacetylene welds of unknown origin; 70 per cent efficiency.

Welds made with bare electrodes: 50 per cent, but only if relatively sound and in locations where bending stresses do not occur.

Forge welds: 70 per cent, unless obviously suspicious.

Brazed laps: 70 per cent.

Sound, uncorroded welds, known to have been made under A. P. I.-A. S. M. E. code; allow the joint efficiency stated in the code of corresponding date.

Stresses in many elements of pressure vessels—especially pipe connections, saddles, heads—are not susceptible of mathematical analysis. Elements themselves may be safe enough, but so located that they throw excessive stress in the adjoining shell. One way of checking this is to clean the vessel, paint it with white wash, subject it to slowly mounting pressure, and watch for evidence of plastic overstrain.

Remove Weak Elements

Frequently it occurs that the main vessel may have a satisfactory factor of safety (say 4), yet some attachments have a factor of safety of only 2. Often the best way to correct this is to remove the offending detail entirely, and replace it with a properly designed one, properly attached. Unreinforced openings for small pipe are frequent and induce stress concentrations of 2 to 2½ times average.

Repairs by welding obviously must be done with all the precautions called for by the pressure vessel code and the resulting job adequately stress-relieved, inspected and proofed.

Welding of cast iron was a subject attracting attention in one technical session. Speaking on this subject, Prof. Gilbert S. Schaller, University of Washington, Seattle, pointed out that welding of this material is now almost exclusively a reclamation rather than a production process. He also emphasized that a repair job results from an overpowering load on a piece of metal, and that if the piece is to be repaired successfully it must be stronger than it was originally. Successful welding of cast iron, in most instances would therefore require a metal at the joint that is definitely superior to soft gray iron.

Too often a casting is made primarily with some special manufacturing characteristic in mind, such as ease in casting or ease in machining. If proper attention had been given to the strength characteristics, melting practice or the composition or both would have been modified to give one of the

(*Please turn to Page* 84)

Carbon Brazing

This comparatively new method has wide field of application. Advantages include time and cost economies, elimination of pretinning, reduction of joint overlap

■ EXPERIENCE over a period of several years has shown incandescent electric carbon brazing to have several advantages, members of the American Welding society were told recently in a joint paper presented by Walter Reed of General Electric Co., Schenectady, N. Y., and Leo Edelson of Handy & Harman Co., New York.

Essentially, this method of brazing consists of assembling the joint, clamping it between the electrodes of a pair of brazing tongs, and passing electric current through the work. Advantages claimed are: Less time and less cost than with mechanical or soft solder joints, lighter sections of metal can be joined, joints do not require pretinning, parts can be joined close to insulation or supporting members, length of joint lap can be reduced. Silver brazed joints, when properly made, stand up under thermal overload, vibration, and corrosion as well as mechanical and electrical stress. In addition, joints readily can be made in the field.

Transformer is Portable

Alternating current is supplied to brazing tongs directly from a portable transformer designed to furnish the required current. A foot-operated switch is used. Typical 10-kilovolt-ampere carbon brazing set is shown in Fig. 2. Ordinarily, primary voltage is 220 volts and secondary voltages range from 7.5 to 12 volts.

Soft, hard and extra hard electrodes are available. The soft electrode has a low surface resistance, practically eliminating overheating the work in spots or burning the surface of the work through too rapid heating. It is of particular advantage for use by new operators. The hard type has greater surface resistance and operators should be given a certain amount of training before this electrode is used. With it, brazing temperatures can be had at about 30 per cent less current.

The extra hard electrode has high surface resistance. Danger from burning the joint surface is such that this electrode should only be used by skilled operators. Its outstanding advantage is that it offers top brazing temperatures with only about 50 per cent of the current required by soft electrodes. This means comparatively large joints can be made quickly with standard brazing equipment.

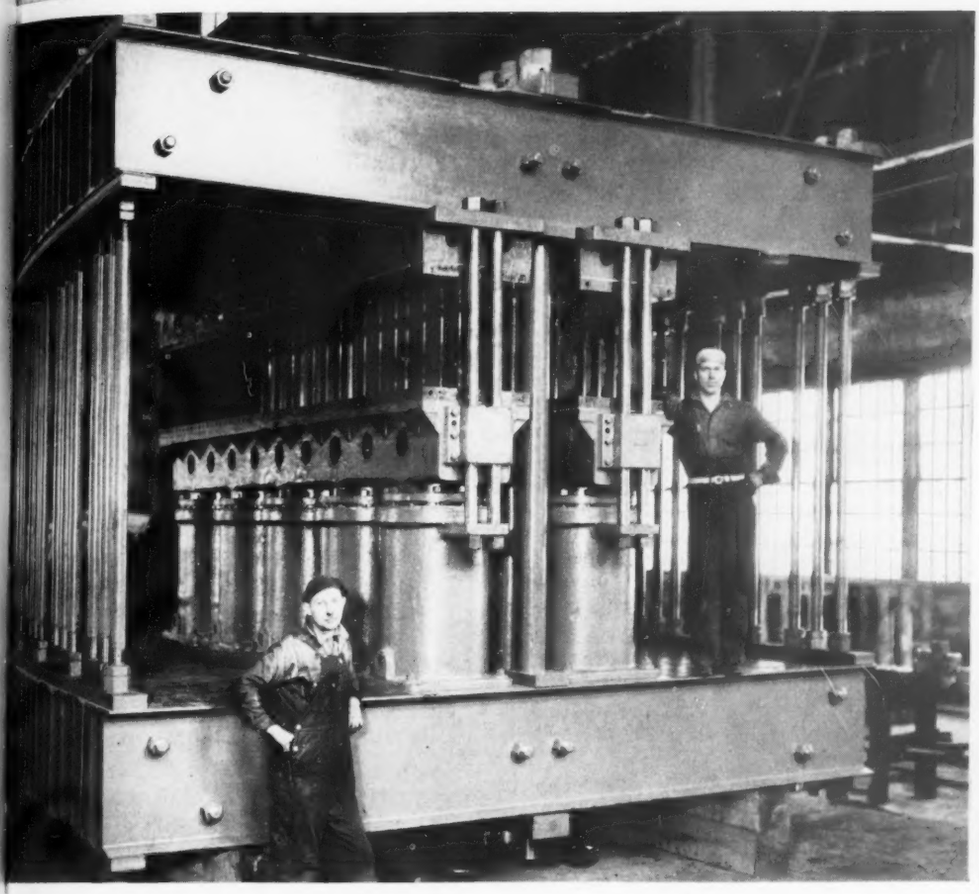
Investigations have shown that the best silver-brazed joints are obtained when there is some degree of diffusion between the alloy and the metal. Diffusion is a time and temperature reaction and will vary with type of metals joined. Majority of nonferrous alloys show this diffusion. With steel and alloys that have comparatively high melting points it is more difficult positively to determine diffusion, but evidence indicates some degree of diffusion in all properly made silver-brazed joints.

Heated Under Pressure

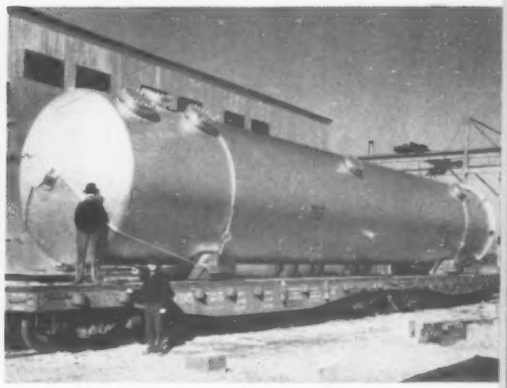
A basic reason for consistently good joints made by incandescent carbon brazing is that the joints are heated under pressure. In making lap joints, for example, members are clamped between electrodes under sufficient pressure to hold the parts securely together and make full even contact. Current is usually applied intermittently so that heat is evenly distributed. Heating continues until the proper brazing

Fig. 1 — Stationary press-type incandescent carbon brazing setup. Operator is brazing laminated copper strip from primary of current transformer to heavy copper bar forming transformer terminal. Photos courtesy General Electric Co., Schenectady, N. Y.

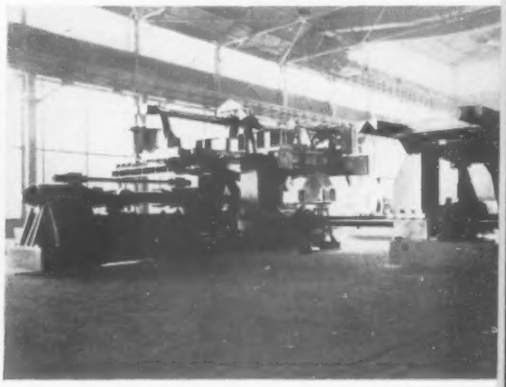
WANT TO CUT COSTS WITHOUT CUTTING CORNERS?



1 You can make real savings in fabricating heavy work, such as this 2000 ton press, with Murex. Many shops report 20% reductions in actual welding time on heavy fillets and downhand work. *Photo courtesy Adamson Machine Co., Akron, O.*

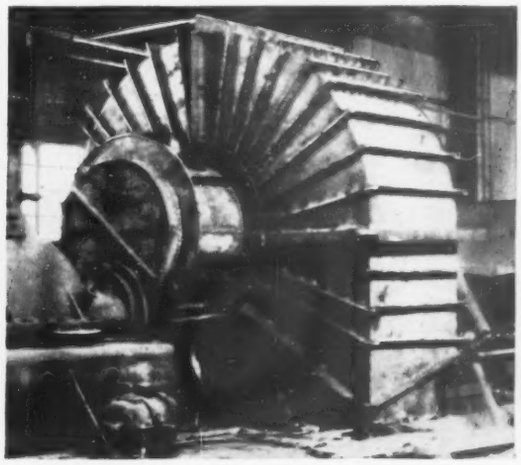


2 Rejected seams cease to be a factor if you use Murex. One plant has a record of nearly 250 Murex welded vessels with every weld flawless under X-ray. *Photo courtesy Vulcan Steel Tank Co., Tulsa, Okla.*



3 No need to worry about physicals. In the world's largest welded machine, for manipulating 25,000 lb. ingots, Murex welds are standing up perfectly. *Photo courtesy Morgan Engineering Co., Alliance, O.*

Your welders will like the easily removed slag and the smooth, spatter-free Murex deposits that save ...ning time and give a better looking job.



5 Dampness in your plant won't harm Murex coatings. Built with electrodes salvaged from a flood, this housing proved vacuum-tight. *Photo courtesy Andrews Steel Co., Newport, Ky.*

More and more steel fabricators are turning to Murex Electrodes for help in cutting welding costs without sacrificing quality.

The chances are that you will find the same advantages in Murex that others do. Write and ask to have the Murex representative in your territory call and show you the outstanding advantages of these heavy coated electrodes. At the same time, make use of his broad experience in welding procedure, in shop practices, and in production welding methods. Put him to work as a welding consultant.

Write, too, for the Murex pamphlet, a handy pocket-size book giving welding characteristics, applications and physical properties for twenty different Murex Electrodes.

MUREX HEAVY COATED ELECTRODES

METAL & THERMIT CORPORATION, 120 BROADWAY, NEW YORK, N. Y.

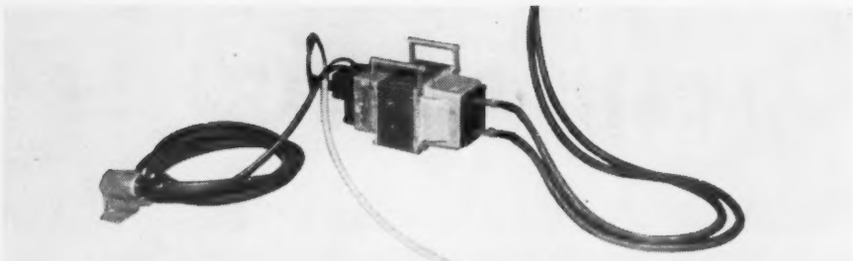


Fig. 2—Typical electrical brazing outfit. It is rated 10 kilovolt-amperes and includes foot switch as well as special clamp tongs with carbon electrodes

temperature is reached, indicated by free flowing of the brazing alloy.

In making butt joints on materials up to one inch wide, ends to be joined should be square and butted tightly together. Electrodes are applied to the thin sides of both members. Straight butt joints can be used on metal ⅛-inch thick and less. On larger thicknesses the members must be scarfed approximately three times thickness of members.

When cable is brazed, strands should be wrapped so that they will retain their position. Then cable should be flattened and assembled between the electrodes. Heating is the same as in making lap joints but when joining cable, brazing alloy must be applied at the cut end of the piece.

Any Size Made

Where work can be brought to a definite point, it is generally advisable to use stationary equipment on which joints of practically any size can be made. The equipment usually consists of a press and apparatus to control electrode motion. Pressure is produced by means of an air cylinder or toggle. Presses with capacities up to 100 kilovolt-amperes are in constant use. For press work, soft electrodes are most commonly used. Fig. 1 shows a typical setup of such equipment.

One of the questions most frequently asked in connection with use of silver alloys is in regard to their corrosion resistance. It compares favorably with that of copper, copper alloys, nickel silver and other nonferrous metals and alloys used for their corrosion-resistance. Galvanic corrosion is probably the most important to be considered when joints made with silver alloys are subjected to various corrosive agents.

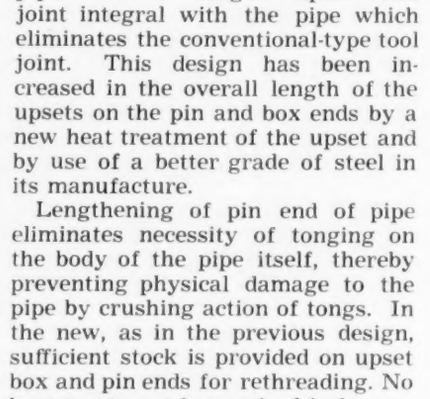
As laboratory tests are likely to be misleading, it is advisable to place specimens of brazed joints under actual service conditions for sufficiently long periods of time to obtain reliable data.

Oil Drill Pipe Is Improved

■ Integral-joint drill pipe developed several years ago by Jones & Laughlin Steel Corp., Pittsburgh, for use by the oil industry, has been further improved. As in the past, this drill pipe has a forged upset tool joint integral with the pipe which eliminates the conventional-type tool joint. This design has been increased in the overall length of the upsets on the pin and box ends by a new heat treatment of the upset and by use of a better grade of steel in its manufacture.

Lengthening of pin end of pipe eliminates necessity of tonging on the body of the pipe itself, thereby preventing physical damage to the pipe by crushing action of tongs. In the new, as in the previous design, sufficient stock is provided on upset box and pin ends for rethreading. No heat treatment is required before or after rethreading operation.

Lengthening of these upset ends has been made possible by the installation of an upsetter developed on specifications prepared by the company's engineering department. The first of its size built, this huge upsetter is capable not only of forging the longer upset of the new design, but has made possible the manufacture of integral-joint drill pipe in new large sizes from 5 9/16 to 6⅝ inches outside diameter.



A string of improved integral-joint drill pipe being run in the hole. Pipe is fabricated by Jones & Laughlin Steel Corp., Pittsburgh

Entire Joint Treated

After upsetting operation and before threading, entire joint is heat treated so maximum physical properties in strength and hardness are obtained with maximum toughness as measured by ductility and impact strength. This heat treatment in the steel selected produces a refined grain structure and results in high hardness in the tool joint end of the integral-joint drill pipe. Early advantages have been retained in the new design. The smooth easy change of diameter in the interior of integral joints which greatly reduces turbulence and gives increased mud volume with reduced mud pump pressures, is even more streamlined. Much of the cost of assembling tool joint on drill pipe has also been cut down. Possibilities of washouts and twist-offs in threaded connection of drill pipe to conventional tool joint are likewise eliminated. Records show that some of these strings have drilled more than 100,000 feet in difficult areas without failure.

Pacific Coast Mineral Resources Reviewed

■ *Available Raw Materials for a Pacific Coast Iron Industry Vol V.* by Edwin T. Hodge, consulting geologist; mimeographed, 106 pages, 12 plates, two tables; published by war department; supplied by STEEL, Cleveland, for $1, or complete five volumes $6.

This volume is an addition to the four already published. It describes many iron ore deposits located in Washington, Idaho, and Oregon, giving the geology and grade of the ore, with analyses. Present need of the Pacific Northwest market for iron reduction plants and possible methods of reduction are outlined. A feature is a description of the Ruzicka process for making metallurgical coke from wood, with the byproducts obtainable.

By the same author is a mimeographed volume of 91 pages, with nine tables, a preliminary report on some Northwest manganese deposits, their possible exploration and uses, which sells for 75 cents.

From the same source is a mimeographed volume by Raymond M. Miller, metallurgical engineer, on feasibility of production of ferroalloys in the Columbia river area, selling at 50 cents.

Modern Auto Body Construction Discussed at Detroit Meeting

■ IN ADDRESSING a meeting of Society of Automotive Engineers recently at Statler hotel, Detroit, W. H. Neely, chief designing engineer for Graham-Paige Motors Corp., Detroit, discussed design and construction problems in development of the modern automobile body. He took as his text the 1938 Graham, reviewing each step in its design.

After paying tribute to the late Amos Northrop as having started the design, and to Leonard Keller, who aided in completing the work, Neely related how the chassis, body and design engineers at Graham first analyzed every available piece of information that would help in planning their program.

"Advertising agency surveys, customer contacts, service records, national safety council reports, cost analyses, new developments and devices available through suppliers, and engineering recommendations," he said, "were studied and digested.

"From these we obtained a basis of fact upon which we could begin building. The advertising experts assured us that wheelbase and horsepower are among the important things that a prospect weighs against price. Customer preference indicated that a car without a trunk would be seriously handicapped in the race for sales. Service records gave us a pointer as to what mechanical details should be stressed. Cost analysis established our budgets.

Ample Wheelbase

"To emphasize motion we early realized the importance of having ample wheelbase, so in early studies we slightly exaggerated length in anticipation of a compromise later."

He then went on to say that even with this exaggerated wheelbase the designers soon concluded that the mass, consisting of body, hood, fenders and trunk, would require careful treatment to create the idea of motion because of the width they were holding. Another difficulty encountered was that the windshield angle appeared contrary to the lines that seemed to best suggest motion or action.

"However," he went on, "once we assembled the various ideas, the whole scheme of things seemed to unfold automatically. One thing seemed to suggest the next. The mass treatment that suggested motion reached forward in front, and this opened the way to get added length with which to absorb our extra width. When we had emphasized forward speed in the main body portion, the windshield angle no longer looked contrary but as it might be expected to look, bending backward at an angel.

"Our first real snag came with the fender contours," he said. "The conventional half-circle stopped motion and otherwise would not blend with the fender outline shapes. Finally we agreed upon a maximum overall width and established tire bumping and turning clearances. This study disclosed the possibility of partially covering the tire, and letting this new clearance line sweep back into the fender. Thus balance was restored and motion regained. And as we had previously decided to apron the rear fender, this new line could be repeated there for consistency and still permit the removal of the rear wheel and tire with the use of a bumper-type jack.

"By this time all branches of the organization were in accord on the program. The chassis, body and design engineers had combined their efforts to adapt these studies to the restrictions laid down, and in so doing established a common understanding for further development."

Slides were then shown of the various drawings, quarter-scale sculpture, full-size blackboard drawings and scale wood models in their progressive stages.

In closing, he touched on the probabilities for important changes in the future, such as rear-mounted engines, and indicated engineers would have to give serious consideration to the many advantages this type of construction offers. He said that objections to the radical changes are being rapidly overcome by current developments and cited the reduction of weight per horsepower as an example.

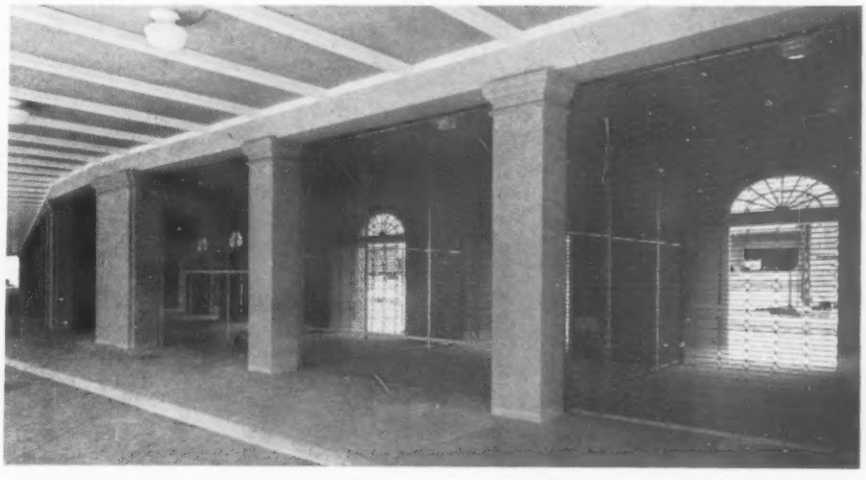
Acquires Line of Protective Coatings

■ Designed for use on industrial equipment, outdoor structures, steel stacks, dry kilns, boiler fronts and maritime equipment, a long-established line of protective coatings resistant to acids, alkalis and other corrosive agents recently was acquired and now is being marketed by M. W. Kellogg Co., 225 Broadway, New York.

Known as I.B.S. coatings for the reason that they impregnate, bond and seal they dry by evaporation and also are non-oxidizing, it is said. Types available include black, aluminum, enamel and a special roofing and also a special odorless coating. Either the brush or the Kellogg hot spray method of application may be employed. The roofing coating has excellent insulating qualities along with other characteristics, it is claimed. Of special interest to meat packing plants, dairies, greenhouses, etc., is the odorless coating.

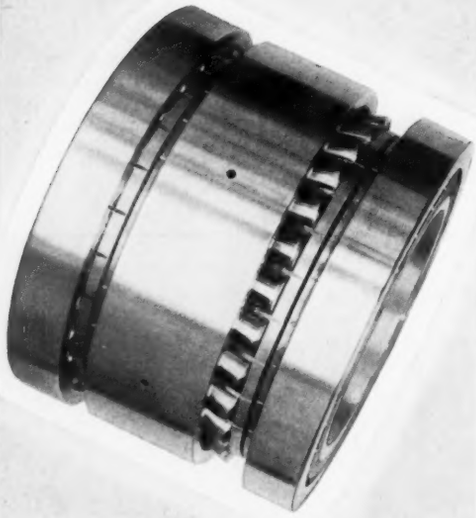
In the plastic form, this material can be used for sealing exterior boiler walls to prevent air infiltration, for caulking around steel sash, flashing around skylights and tank repairs.

Steel Grilles Are on Market



■ **Rapidly growing use of steel is in these rolling grilles made by Kinnear Mfg. Co., Columbus, O., and here shown as a recent installation on a large market house in New Orleans. Grilles can also be made of stainless steel, bronze or aluminum and can be operated manually, by chain, crank or driven by electric motor**

RECORDS PROVE *Quality*



This typical Bantam steel mill bearing is a 4-row tapered roller, 26″ I.D. x 42″ O.D. and 25½″ long.

THE most conclusive proof of quality in any product is its record of performance in the hands of users.

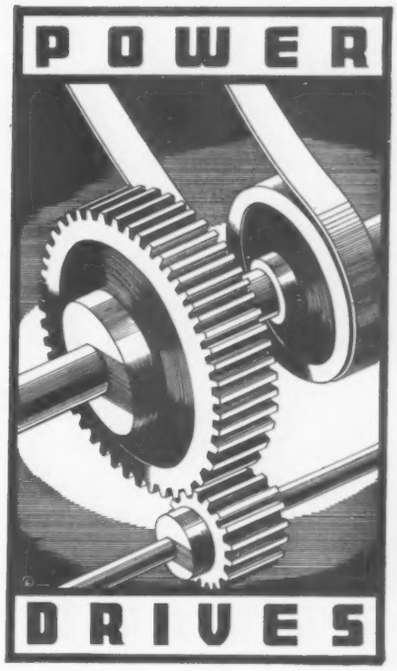
It's a matter of *record* with America's outstanding rolling mills and strip mills, that Bantam Bearings last longer and show a lower bearing cost per ton of steel rolled.

That's the *one* reason why these great mills order and re-order Bantam Bearings so consistently.

BANTAM BEARINGS CORPORATION
South Bend, Indiana
Subsidiary of THE TORRINGTON CO.
Torrington, Conn.

BANTAM BEARINGS

TAPERED ROLLER • • • STRAIGHT ROLLER • • • BALL BEARINGS



Loom Drives

Many textile plants have equipped their looms with individual motor drives using special motors with heavy rotors to produce a flywheel effect for constant speed

■ FLYWHEELS HAVE long been used to maintain speeds on metal working machines subjected to momentary shocks which slow down the operating speed. Within the past year the flywheel has been added to loom drives in textile plants with similar advantages.

Originally looms in textile plants were driven by overhead lineshafting through tight and loose pulleys. It was found that the severe shock set up by the shuttle as each pick was completed was momentarily slowing down the drive sufficiently to cause slippage of the belt on the drive. Slippage makes it difficult to get an even and uniform weave and sometimes causes breakage of loom parts.

Adopt Motor Drives

To overcome this difficulty many textile plants adopted individual motor drives using a special motor with a heavy rotor which would provide the necessary flywheel effect. This, of course, increased the installation and operating cost but resulted in higher quality and quantity of product.

Within the past few years some textile plants have installed flywheels of their own design. Most of these have been very satisfactory in smoothing out the effect of the pulsating shock loads although a few did not have the proper size of flywheel.

Recently the special loom drive shown in the accompanying illustration was designed and built by a manufacturer of power drives to install on existing looms, replacing the tight and loose pulleys and shifter.

The flywheel pulley is carefully designed to give the necessary flywheel effect by proper distribution of weight. The hub is designed so that an expanding ring clutch mechanism can be built into it. The clutch operating lever and outboard bearings were designed to fit the loom and meet operating requirements.

The carefully turned and balanced clutch flywheel pulley operates at constant speed from the tight belt. As the belt need not be shifted, it does not stretch and loosen. When the clutch is disengaged the flywheel runs idle on a flanged sleeve keyed to the loom shaft. When the clutch is engaged by operating the shipper lever, friction is obtained through a molded asbestos friction lining. In case of a bang-off the clutch releases, the flywheel runs loose on the sleeve and the loom is quickly stopped by the brake mechanism.

The use of this drive increases both quality and quantity of the cloth produced, it is said, and also smooths out the operation of the loom and reduces breakage of parts. The flywheel provides sufficient extra power during the peak point of extra requirement to maintain an even speed. The loom drive mechanism is manufactured by Dodge Mfg. Corp., Mishawaka, Ind.

Perhaps other types of machines which are subjected to uneven operation might be able to use a flywheel to advantage. Although a flywheel is an old mechanism, much has been learned about its design and use within recent years. When installing V-belt drives, for example, advantage is taken in many cases to provide added flywheel effect in the new sheave and permit the new drive to operate better than

Flywheel pulley with expanding ring clutch replaces tight and loose pulley on loom drive to smooth out shock pulsations in operation. Photo courtesy Dodge Mfg. Corp., Mishawaka, Ind.

was possible with the lighter flywheel.

Bearings Lubricated by Screw-Top Grease Cups

■ Bearings on a large machine which was subjected to considerable vibration in operation were lubricated by screw-top grease cups. Because of the vibration the tops and sometimes the entire cup would shake loose and fall off. This resulted in either no lubrication or exposed the grease in the open cup to the dusty atmosphere.

To correct this difficulty the grease cups were replaced with pressure fittings which, because of their smaller size and weight, did not vibrate so much nor shake loose in operation. Also, this prevented the bearing trouble which had resulted from dust falling on the grease while the cup was being filled. Furthermore, bearings were lubricated in less than half the time formerly required for filling cups.

♦

An efficient group drive has been defined as a co-ordinated and useful assembly of machines operated economically and efficiently together. To establish efficient grouping, the consideration of production cycle, load cycle, characteristics of the individual machines and the combination characteristics of the entire group are required.

♦

In a plant manufacturing roller chains approximately 98 per cent of all machines are group driven. The motors are mounted on the ceiling with roller chains driving the lineshafts and a few countershafts, and with belts running from shafts to machines. Most of the machines are of the automatic type such as punch presses, bushing-forming presses, multiple drills and assembling presses. The groups range in size from 4 to 12 machines. Each group is planned to fit in with the continuous flow of production.

♦

When planning any drive, consider how it contributes to the final product. That is, instead of planning the drive as related to individual machines, study its relation as the prime mover of the unit of production, which unit may consist of one or a number of machines.

♦

Putting an individual motor on each machine regardless of the work of the machine or its relation to the operation of other equipment is no longer considered to be the only modern application of power drives. Usually the best, most modern and economical method is to drive equipment individually or in groups according to how the machine or machines fit into the production program.

♦

In a plant with roof trusses too light to support lineshafts, the steel superstructure are held up by properly spaced pipe supports with the roof trusses merely preventing side sway. Motors for two parallel shafts are mounted on platforms resting on two channels extending across between the stringers supporting the shafts.

♦

Lubrication of a machine bearing hidden behind a moving cam was hazardous and frequently neglected unless the machine was idle. This was remedied by removing the grease cup and extending a short pipe with pressure-gun fitting to a safe point above the cam at its highest travel.

♦

Originally maintenance was devoted to repairs; today the emphasis is on preventing the necessity of repairing.

♦

Maintaining uninterrupted operation, at the lowest economical cost should be the aim of those responsible for power drives. This may not mean at the lowest possible expense.

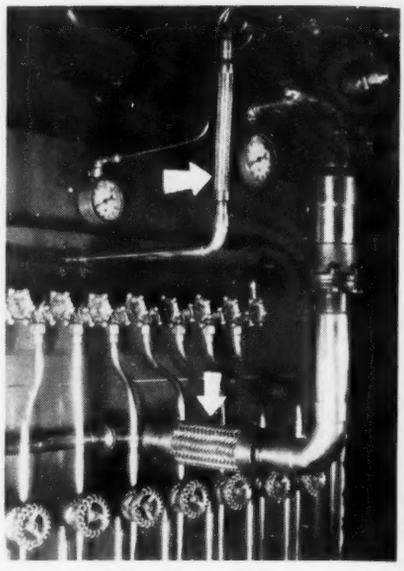
♦

In a small plant which required the services of only one man for e'ectrical and mechanical servicing and maintenance the practice was to hire an electrician and train him in mechanical servicing rather than train a mechanical man in electrical work.

♦

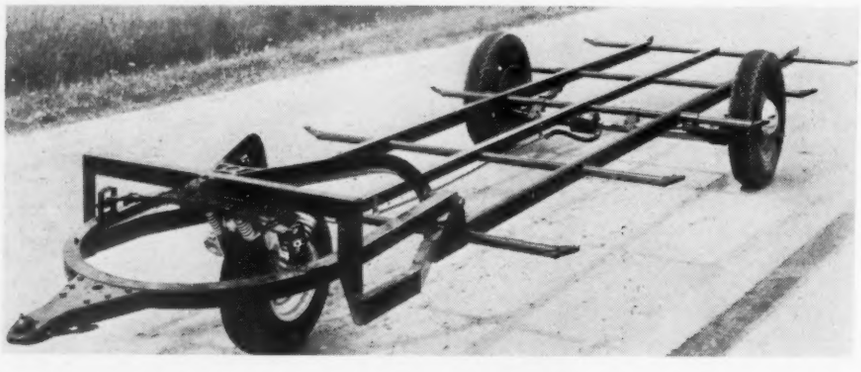
Maintenance costs of servicing and repairs are considered as separate items. Increases in the cost of servicing properly performed should give corresponding decreases in repair costs. The actual savings will be still greater. Before time lost for repairs often cost as much or more than the material and labor expense.

Stop Vibration

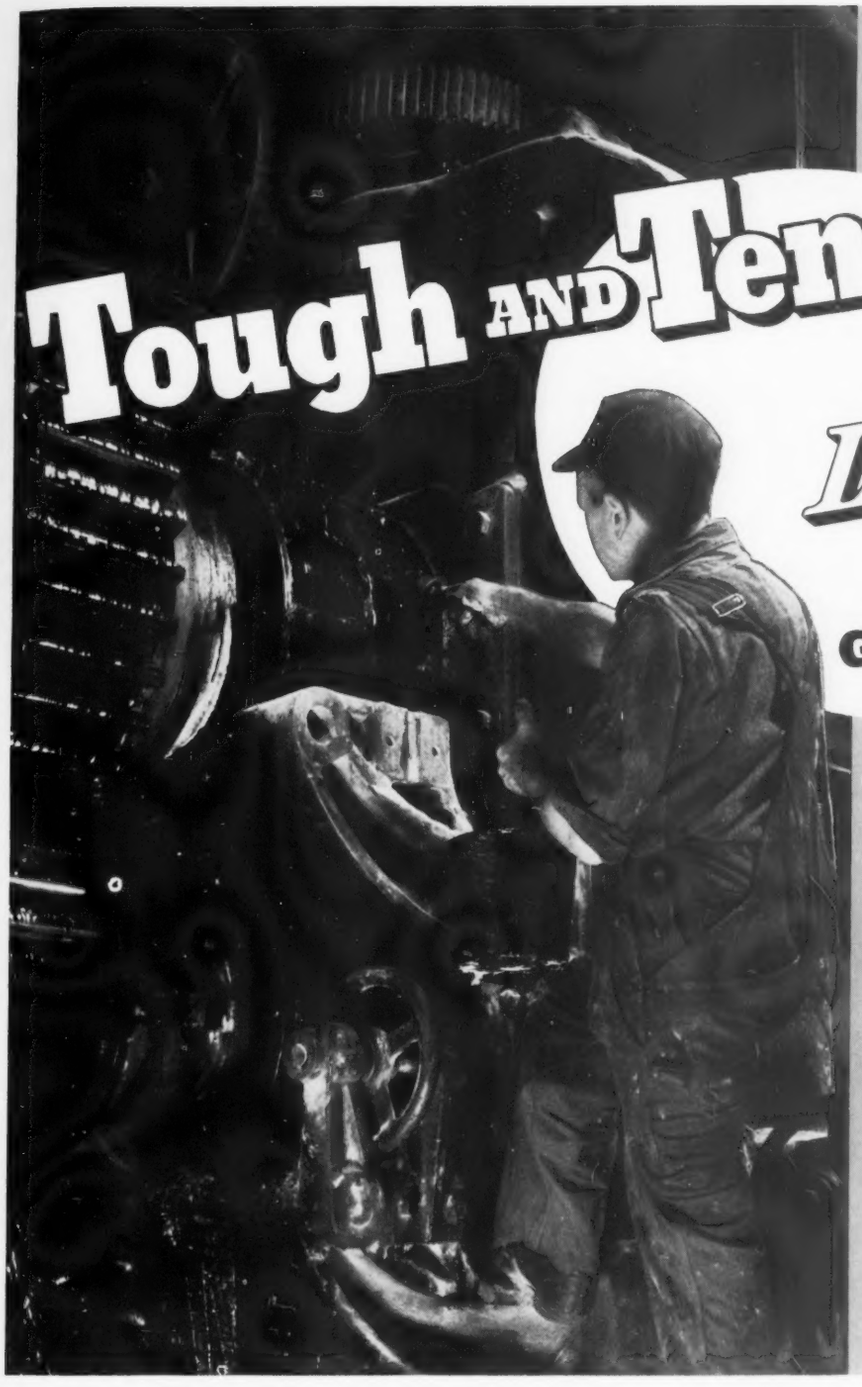


■ **Vibration eliminators consisting of short sections of flexible seamless bronze tubing with standard copper tube slip fittings welded on both ends prevent the transmission of noise and vibration from compressors or pumps through pipe lines to building structures. Photo courtesy American Metal Hose Branch, The American Brass Co., Waterbury Conn.**

Transforms Light Pick-up into Heavy Truck



■ **Development of a self-aligning third wheel by Saginaw Stamping & Tool Co., Saginaw, Mich., makes a trailer totally self-contained when detached from the tow car. Third wheel can be adjusted so that it carries all or part of the load thus placing no strain on the rear axle of the tow car. Entire trailer is designed for use with a light pick-up truck which can be used for small loads when it would not be economical to use a heavy truck or while trailer is being loaded**



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GULF LUBCOTE IS THE IDEAL GEAR LUBRICANT

FOUR REASONS... WHY GULF LUBCOTE IS THE LUBRICANT OF UNPARALLELED QUALITY FOR OPEN GEARS

1 GULF LUBCOTES are heavy bodied products especially manufactured to have the requisite property of high adhesiveness for metal surfaces necessary in lubricants for open gears.

2 Due to selected crudes used and to the process of refinement employed, GULF LUBCOTES possess unusual lubricating qualities together with the essential property of flowing with the movement of the gear and pinion teeth.

3 The lubricating film provided by GULF LUBCOTES, in addition to being impervious to moisture, acid fumes and gases, will withstand extreme temperature changes without deterioration.

4 Due to the tough and tenacious nature of GULF LUBCOTES they will effectively reduce objectionable gear noise and at the same time will provide maximum protection against corrosion, pitting or excessive wear of the gear teeth.

EASY TO APPLY... LONG LASTING

WHEN you put it on, *it stays on!* That's one of the characteristics which make Gulf Lubcote the ideal gear lubricant. This heavy-bodied lubricant has great adhesiveness, yet it is sufficiently mobile to insure proper spreading between sliding surfaces under heavy pressures.

Gulf Lubcote will not dry up, crack, or peel off of gears. It does not gum or harden with age, nor is its efficiency impaired by climatic changes.

Try this tough, tenacious lubricant for your gear trains. It is made in seven grades to fit various gear types, open or enclosed, and to provide for a wide range of operating conditions.

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GENERAL OFFICES: GULF BUILDING, PITTSBURGH, PA.

MAKERS OF A COMPLETE LINE OF FUEL AND FURNACE OILS

GULF INDUSTRIAL LUBRICATION

Foundrymen Announce Program for Annual Convention in Cleveland

■ TECHNICAL sessions on steel, gray iron, malleable and nonferrous castings; management; apprentice training; safety and hygiene; and materials handling; and shop courses on gray iron, malleable and sand, highlight the program for the forty-second annual convention of the American Foundrymen's association in Cleveland, May 16-19. The exposition, embracing 200 exhibits, will open on May 14 and continue through May 19. Convention and exposition will be in Public Auditorium.

Important details of the convention, as announced in the tentative program, are as follows:

Monday, May 16

MORNING

Opening Session

Address of welcome.
Address of president, by H. Bornstein, director, testing and research laboratories, Deere & Co., Moline, Ill.

Gray Iron

"Hints on Molding and Preparation of Castings for Enameling," by R. B. Schaal, Ferro Enamel Corp., Cleveland.
"Relation of Microstructure to Enamelability of Cast Iron," by Dr. G. H. Spencer-Strong, Porcelain Enamel Mfg. Co., Baltimore.
"Classification of Graphite Size," committee report by Chairman W. E. Mahin, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
"Fluidity Tests," committee report by Chairman W. H. Spencer, Sealed Power Corp., Muskegon, Mich.

Nonferrous Founding

"Heat Treating Zinc Bronze Pressure Castings to Close Up Leakage," by H. Fleck and T. C. Bunch, Pearl Harbor navy yard, Honolulu.
"Risers and Gates for Nonferrous Castings," by A. E. Cartwright and C. C. Brisbois, Robert Mitchell Co. Ltd., Montreal.
"Fluidity of Red Brass," by G. P. Halliwell, H. Kramer Co., Chicago.
Annual business meeting of nonferrous division. Report of committee on "Analysis of Defects"; report of committee on "Recommended Practice"; election of officers.

NOON

Chapter conference luncheon meeting.

AFTERNOON

Foreman Training

Address by A. C. Horrocks, educational director, National Association of Foremen, and Goodyear Tire & Rubber Co., Akron, O.

Gray Iron

"Physical Properties of Cast Iron in Heavy Sections," by E. R. Young, V. A. Crosby and A. J. Herzig, Climax Molybdenum Co., Detroit.
"Some Effects of Blast Pressure on Cupola Operations," by C. K. Donoho and Dr. J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.
"Characteristics of Cokes for Cupolas," (review of a paper before Institute of British Foundrymen by J. G. Pierce and Dr. Hugh O'Neill), by J. A. Bowers, American Cast Iron Pipe Co., Birmingham, Ala.
"Cupola Practice," by Marcel Dudouet, Ecole Superieure de Fonderie, Paris. Exchange paper of French Foundry Technical association.

Cast Iron Shop Course

Session 1—"Cupola Operation," by D. J. Reese, International Nickel Co. Inc., Bayonne, N. J.

EVENING

Dinner meeting of engineering and shop practice instructors.

Foundry Refractories

"Effects of Cupola Practice on Linings," by C. K. Donoho, American Cast Iron Pipe Co., Birmingham, Ala., and C. F. Greene, Atlantic Refractories Co., Macon, Ga.
"Characteristics of Silica Refractories Used in the Cupola," by W. J. Rees, head of refractories department, University of Sheffield, Sheffield, England. Exchange paper of Institute of British Foundrymen.
"Refractories for Foundry Ladles," by C. E. Bales, Ironton Fire Brick Co., Ironton, O.

Job Evaluation

"Job Evaluation for the Smaller Foundry," by E. L. Roth, Motor Casting Co., Milwaukee.
"Demonstration of Use of Occupational Rating Plan of Industrial Management Society," by Ralph H. Landes, Western Electric Co., Chicago, and director of study and research, Industrial Management society.

Tuesday, May 17

MORNING

Sand Shop Course

Session 1—"Practical Problems of Nonferrous Sand Control."

Nonferrous Castings

"Role of Silicon in Nonferrous Castings," by Dr. H. W. Gillett, Battelle Memorial institute, Columbus, O.
"Description of Age Hardening Process as Applied to Castings," by L. W. Kempf, research laboratories, Aluminum Co. of America, Cleveland.
"Production of Castings in Age Hardenable Nickel-Tin Bronzes," by T. E. Kihlgren, International Nickel Co. Inc., Bayonne, N. J.

Steel Session

"Report of Committee on Radiography," by Chairman C. W. Briggs, naval research laboratory, Washington.
"Effects of Aluminum on Physical Properties of Medium Carbon Cast Steel," by C. E. Sims and F. B. Dahle, Battelle Memorial institute, Columbus, O.

Gray Iron

"Deoxidation and Graphitization," by R. G. McElwee, Vanadium Corp., of America, Detroit.
"Comparative Effects of Late Additions of Silicon and Titanium to Cast Iron," by G. R. Comstock and E. R. Starkeweather, Titanium Alloys Mfg., Niagara Falls, N. Y.
"Formation of Graphite in Gray Iron," by Alfred Boyles, Battelle Memorial institute, Columbus, O.

NOON

Nonferrous division luncheon and round-table conference. Topics—"Crucible Melting Furnace Developments," by R. J. Stone, Vesuvius Crucible Co., Swissvale, Pa.; "Analysis of Causes and Remedies for Certain Types of Defective Castings."
Gray iron division luncheon and round-table conference. Topic—"Graphitization and Inclusions in Cast Iron."

AFTERNOON

Apprentice Training

"Wisconsin Training Plan," by J. E. Tepoorten, co-ordinator, occupational extension service, Wisconsin vocational schools, Madison, Wis.
"Foundry Apprenticeship in a Commercial Shop," by E. N. Brough, Fairbanks, Morse & Co., St. Johnbury, Vt.
"Canadian Apprentice Training Situation in Western Canada," by A. W. McCallum, Anthes Foundry Ltd., Winnipeg, Canada.

Foundry Cost Methods

"Melting Costs"
"Nonferrous," by A. E. Grover, Berea, O.
"Steel," by W. J. Corbett, Atlas Steel Castings Co., Buffalo.
"Malleable," by R. E. Belt, Malleable Founders' society, Cleveland, and C. S. Anderson, Belle City Malleable Co., Racine, Wis.
"Gray Iron," by P. E. Rentschler, Hamilton Foundry & Machine Co., Hamilton, O., and W. J. Grede and R. E. Lee, Liberty Foundry Co., Wauwatosa, Wis.

Steel Castings

"A Study of Steel Molding Sands," by H. W. Dietert, E. E. Woodliff and J. A. Schuch, Harry W. Dietert Co., Detroit.
"Report of Committee on Methods of Producing Steel for Castings," by Chairman H. D. Phillips, Dodge Steel Co., Phiiadelphia.
"Report of Committee on Heat Treatment of Steel Castings," by Chairman D. C. Zuege, Sivyer Steel Casting Co., Milwaukee.

Cast Iron Shop Course

Session 2—"Cupola Practice—Burnt Iron."

EVENING

Stag party, Music Hall, Public Auditorium. Sponsored by Northeastern

(Please turn to Page 84)

One of the **LARGEST** Chilled Diameters **EVER CAST**

This 53" diameter chilled casting to be used as a hydraulic ram, was cast at Birdsboro by the same process used in the casting of Birdsboro Chilled Rolls.

By the very nature of its use, a ram demands all the exacting care in casting that goes into the finest of rolls. Whatever your roll needs may be, Birdsboro can meet them, regardless of size.

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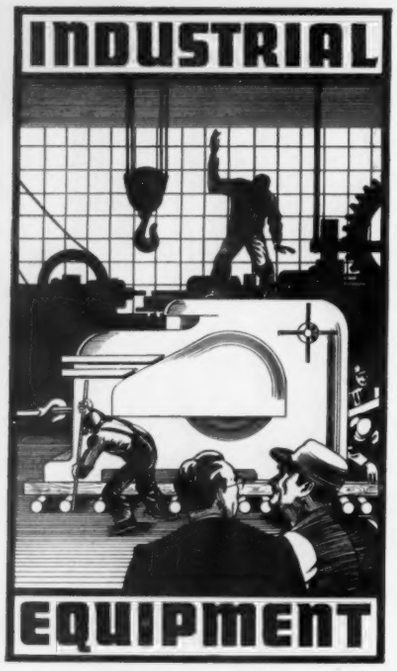
STEEL AND CHILL ROLLS • STEEL CASTINGS • HYDRAULIC MACHINERY • SPECIAL MACHINERY • CRUSHING MACHINERY • STEEL MILL EQUIPMENT



Tractor Handles Wider Strip Coils

■ Automatic Transportation Co., 53 West Eighty-seventh street, Chicago, has added to its line ram and fork tractors to handle wider welded type coils 84 to 96 inches long, weighing 20,000 to 30,000 pounds.

Outstanding feature is the Steer-o-matic drive, designed to provide driving and steering efficiency. This is a combination drive unit and motorized steering turntable, controlled automatically—separately by remote power steer and fully remote contactor control with automatic drive acceleration from operator's station. In this drive there are no universal joints and no steering knuckles, rods or connections.

In construction it is a powerful, double reduction spur gear transmission powered by a super-service duty motor. Power is transmitted through extra wide-faced, heat treated, chrome nickel steel gears and pinions mounted on shafts with self-aligning ball bearings. Extra large diameter chrome nickel steel full floating drive axles are used, and they are fitted with splined ends and heat-treated for high tensile strength and driving torque. Wheels are fitted to axle housing with extra large adjustable roller bearings. The complete drive unit is mounted to steering turntable with a pivoted connection for fully equalized traction to compensate for uneven runways and to relieve main frame from torsional strains or stresses.

Another feature of the new machines is the arrangement of load wheels, which are quadri-mounted, that is, four abreast. This is said to permit more compact chassis construction and to permit much larger diameter wheels with wider faced tires and other advantages.

All wheels, tires and wheel bearings are fully interchangeable. The wheelbase is only 90 inches and the tractor has a turning radius of only 125 inches. It is said that they will operate in a right angle aisle of 139¼ inches. Frame is all-steel, fabricated into one unit by hot riveting and welding. One piece, heavy section, high carbon rolled steel plates form the main side body. These are riveted and welded to supplementary members. New type inclined tiering uprights consist of heavy H section columns faced with machined plates upon which ram or fork carriage travels.

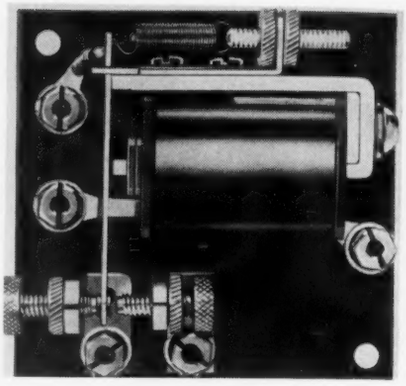
Carriage is an alloy steel casting mounted with two pairs of heavy steel plate cantilevers. Hoisting and lowering are accomplished by two double strand, two part alloy steel roller chains.

Enclosed Relay Is Highly Sensitive

■ Ward Leonard Electric Co., Mt. Vernon, N. Y., has placed on the market an alternating-current relay which is claimed to be very sensitive. Relay is available with single pole, double throw contacts.

High degree of sensitivity, good contact torque at pull-up and a constant drop-out is made possible by the use of nickel alloy in the magnetic circuit. Coils are available for currents from 1.5 to 450 milliamperes. Large knurled nuts facilitate adjustments of silver contacts and armature spring tension.

Relay is furnished with a bakelite case approximately 2 inches square, and may be mounted in any position without altering its performance.

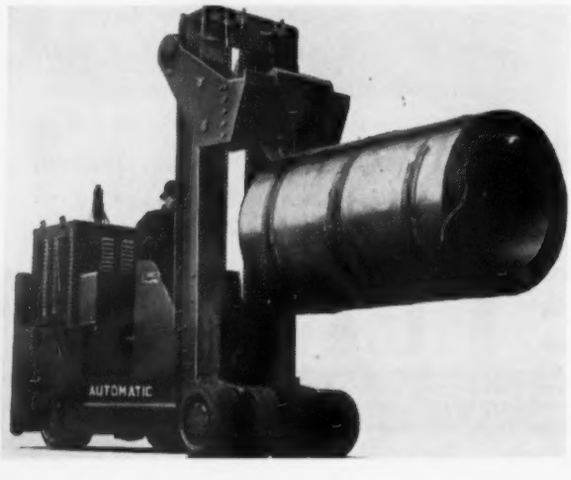


Coils for this Ward Leonard relay are available for currents from 1.5 to 450 milliamperes

High Speed Shear Trims Bulky Shapes

■ Libert Machine Co., Green Bay, Wis., has placed on the market a high speed shear arranged with a special lower cutting head that permits flexibility in cutting formed pieces of sheet metal.

Unit is adapted to trimming flash from stampings after the first draw. Its use is claimed to be profitable on short runs, or when the formed piece is of rather large or bulky shape such as automobile fenders. No starting holes are required for inside cutting. The machine shears instead of punching the metal, making cuts on a formed radius as small as ⅝ inches and up to 90 degrees. Not being an entirely special machine, the unit can be utilized for cutting irregular shapes from the sheet metal.

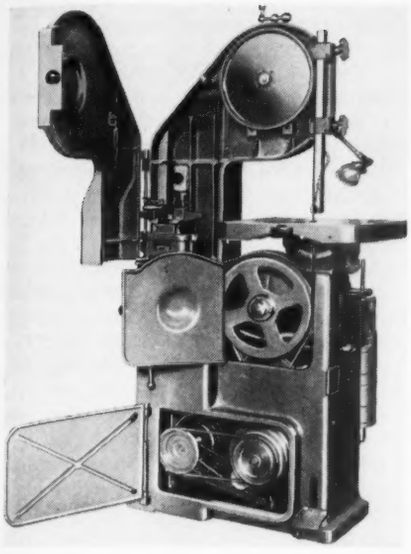


Automatic Transportation ram and fork tractors have a wheelbase of only 90 inches and a turning radius of 125 inches

Various Shapes Cut From Heavy Metals

■ Grob Bros., Grafton, Wis., has introduced a metal band saw which cuts various shapes from thin sheet metal to steel 8 inches thick. Unit is known as the NS-14 model and is sturdily constructed.

By opening its upper door, the operator has access to an electric brazer which is built in the upper arm and mounted on a slide. A saw blade clamp also is mounted in the frame, and a file to facilitate join-



Illustrated above with doors open is a Grob Bros., type NS-14 metal band saw. This unit has a 20 x 20-inch table which tilts on two planes

ing of saw bands for internal sawing.

The 20 x 20-inch table is of rigid design and tilts on two planes. A slot in the table makes insertion or changing of joined saw blades an easy matter. The toggle arrangement makes it possible to rotate the work without releasing the feed pressure. If the saw cuts into the opening, it will not crash through and break by bumping against the other end, but will move forward easily since it is checked by a hydraulic cylinder.

Saw guides are made of tough metal and have the propriety of never building up with steel. As guides never scratch or tear the saw blade, a very close fit can be made so that the blade is guided securely which is important to follow a line closely when cutting curves. Both guides are adjustable in height. Lower guide can be brought flush with the table, or for special jobs, several inches above the table surface.

The unit has a ½-horsepower motor mounted in the base and speeds of 60, 90, 135, 225 and 375 feet per minute are obtained through a silent V-belt drive. All pulleys are mounted on scaled ball bearings. The distance from floor to table is 42 inches and the total height of the unit 69 inches. The machine takes up about 17 x 31 inches of floor space and weighs 1000 pounds.

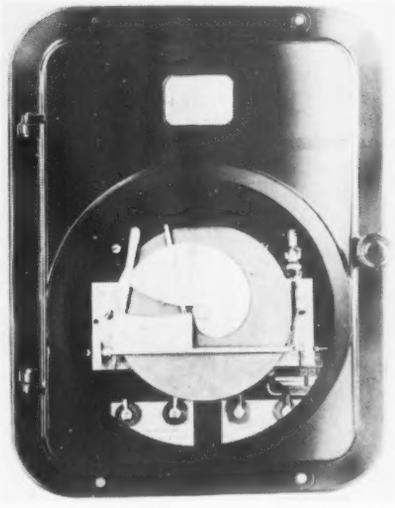
Belt Idler Carries Non-Abrasive Materials

■ Jeffrey Mfg. Co., Columbus, O., has placed on the market a ball-bearing belt idler for carrying moderate loads of semi and non-abrasive materials.

Idler is of the conventional 3-pulley, 20-degree, troughing type made for belts ranging in size from 14 to 36 inches. Ball bearings are of the commercial type with a cork seal within a pressed steel labyrinth dust cap. Pulleys are welded steel pipe 4 inches in diameter and have steel gudgeons welded in the ends.

Instrument Devised For Telemetering Units

■ Bristol Co., Waterbury, Conn., has placed on the market an instrument for telemetering electrical units from small millivoltages up to the totalized power output of power plants.



A cam driven by a constant-speed motor gives this Bristol telemetering unit the electrical impulses required to operate the system

To operate the system, a cam driven by a constant-speed motor gives the electrical impulses required. This device is designed so that it periodically engages and releases the pointer arm of the measuring element.

Grinding Machine Frame Is Cast in One Piece

■ Covel Mfg. Co., Benton Harbor, Mich., has placed on the market a No. 15 hand feed, surface grinder which has its main frame cast in one piece with three heavy ribs supporting it in the vertical section to insure rigidity.

Spindle of the machine is ruggedly built and mounted in preloaded ball bearings. Unit is driven by a 3-speed, V-belt drive from a 1½-horsepower motor located inside the base. As the base is totally enclosed, it gives the motor much protection from dust and other obstructive materials. Column is provided with a swing door which provides accessibility to the mechanism in order to change spindle speeds to conform to the size of the grinding wheel. An outside handwheel at the right of the column controls the belt take-up for motor adjustment. Motor switch also is enclosed in the column.

The box-section knee of the unit is mounted on the main column by means of vertical dove-tail ways with gibs. These can be adjusted to compensate for wear. Wheel which lowers and raises the knee is graduated in 0.001 inches, and has an adjustable pointer which is set at any position by a thumb screw. Elevating screw is located

Covel No. 15 hand feed, surface grinding unit is driven by a 3-speed, V-belt drive from a 1½-horsepower motor located inside the base

inside a telescoping sleeve. For the operator's convenience, an adjustable wheel truing device with a diamond is mounted over the grinding wheel. This dresses the wheel true with the working surface of the table. A portable water tank mounted on rollers and equipped with splash guards and pump is furnished for wet grinding.

Over-Center Clutches Operated Without Oil

■ Rockford Drilling Machine division, Borg-Warner Corp., Rockford, Ill., has introduced over-center clutches to be used in connection with gasoline or diesel engine drives. They are available for operation in oil or dry, and remain in or out of engagement until changed by the operator.

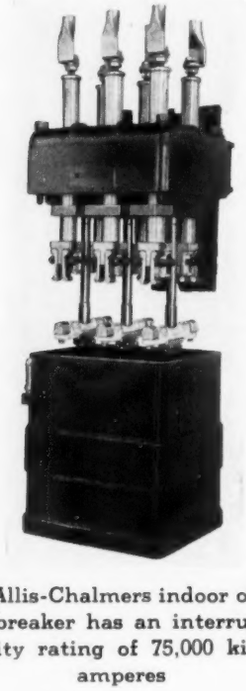
Clutches are made in sizes ranging from 7 to 20 inches in diameter. Capacities of standard single-plate clutches range from 160 to 2000 foot-pounds torque, or 3 to 38 horsepower per 100 revolutions per minute. The double-plate units have a greater capacity, and sizes larger than standard are built to order.

A series of over-size springs assure and maintain complete clearance between driving and driven members when clutch is disengaged. Back plate carries much of the clutch weight and adds to the effect of the flywheel. As roller cams go over center, spring adjusting ring yields slightly thus relieving back plate of strains and introduces a spring-loaded effect, holding the clutch firmly in engagement and maintaining an evenly distributed pressure.

Other features of the clutches include forged steel cam shafts, graphited bronze bushings in the symmetrical operating sleeve, antifriction roller cams and a nonrotating operating collar.

Indoor Circuit Breaker Has Many Applications

■ Allis-Chalmers Mfg. Co., Conduit Works, Boston, has introduced a DX-25, moderate capacity, indoor oil circuit breaker of non-oil throwing construction capable of wide applications for industrial and central station service.

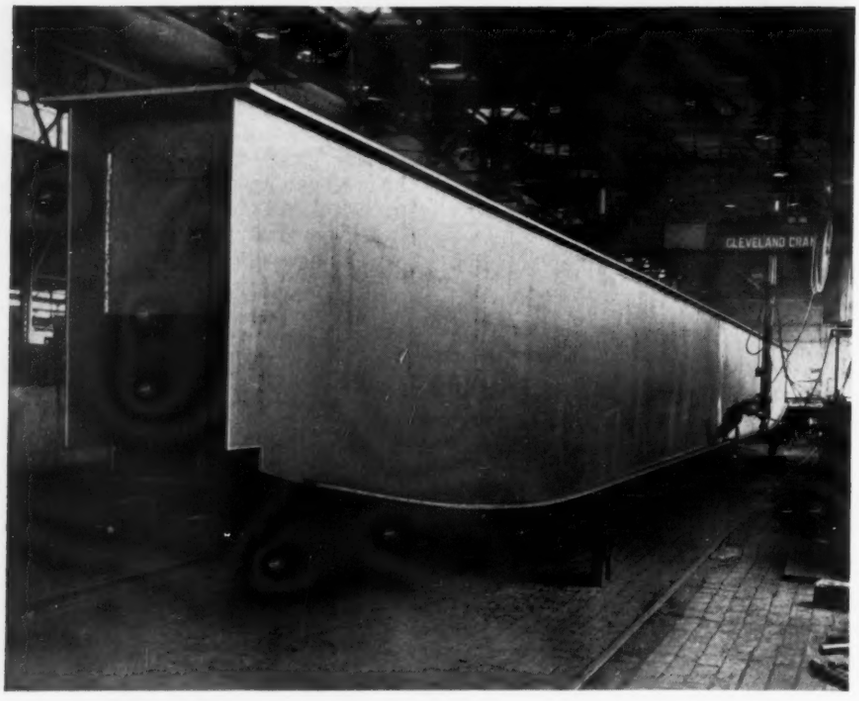


This Allis-Chalmers indoor oil circuit breaker has an interrupting capacity rating of 75,000 kilovolt amperes

Expulsion ports, featured in this breaker, hasten arc extinction, it is claimed. Other features include self aligning wedge and finger type contacts with silver surfaces on main contacts, cast steel top frame, welded steel tank, one piece, bakelain bushings and flat angle, straight-line motion mechanism. Breaker is furnished manually or electrically operated for 600, 1200, and 2000 amperes at 15,000, 7,500 and 5000 volts respectively. It has an interrupting capacity rating of 75,000 kilovolt amperes.

CLEVELAND CRANES

All Welded for Every Industry



• The rigidity and fixed alignment made possible by Cleveland All Welded Girders contribute greatly to the long life of all moving parts.

ALSO BUILDERS OF

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

THE CLEVELAND CRANE & ENGINEERING CO

1125 Depot St.

WICKLIFFE, OHIO

NEW YORK • DETROIT PITTSBURGH • CHICAGO

Special Counting Unit

(*Concluded from Page* 58)

small, has wide use, expensive and is readily disposed of anywhere.

Shortages are checked by careful count of incoming main castings or shells and a recount at final inspection. To overcome the possibility of errors in counting, a 6-foot portable belt conveyor table mounted on rubber-tired casters is fitted with an electric eye counting and recording unit. The motor drive can be plugged in anywhere.

Incoming parts are given first inspection, set on the table, counted as they pass the electric eye, then given a second inspection, if necessary, and placed in toteboxes for transfer to shop. The count for each box is kept separate so that each workman has a definite record of the number of parts and must account for that number in finished or spoiled work.

Assembled units are counted by putting the table at the final inspector's position on the assembly conveyor with the packer at the discharge end.

Storage Racks

■ In erecting basement racks for storing steel and brass bars on end, top of rack is fastened to the cast-in ceiling inserts set on 3-foot centers in a reinforced concrete building. The A-frame of the rack is inclined at an angle of 12½ degrees from the vertical. These A-frames of 3 x 3-inch structural angles are braced and riveted individually. Horizontal cross pieces also of 3 x 3-inch structural angles, are bolted on so the rack can be dismantled and moved in sections.

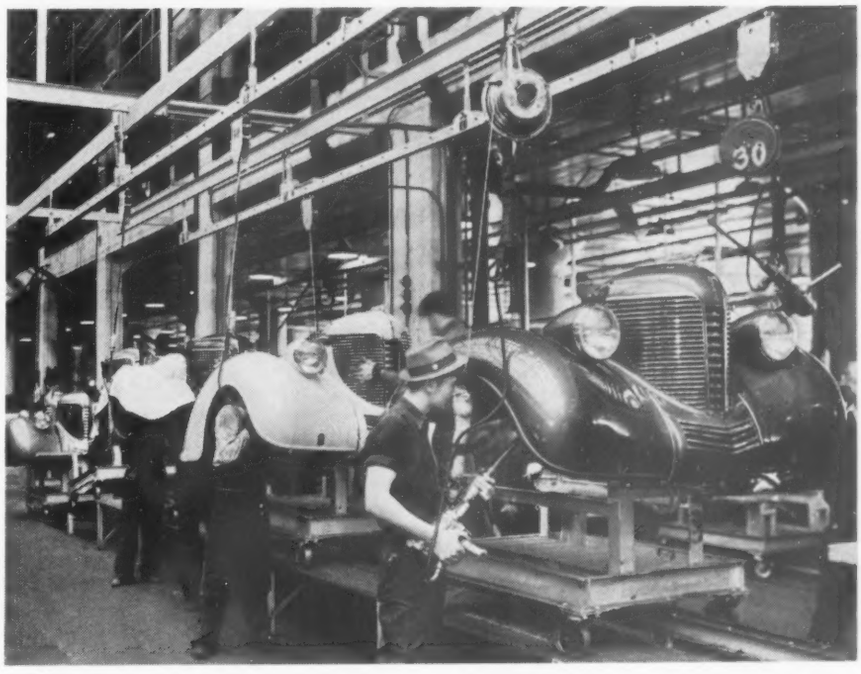
Before this rack was installed and fastened at the ceiling A-frames had to be braced across at the top to prevent tipping in case of unequal loading on one side. These braces interfered with handling the long bars.

Steel bars stand on a ½-inch steel plate bolted to the floor. A 1-inch angle iron bolted to the outer edge of this plate prevents bars slipping off the plate. Brass bars rest on a 2-inch replaceable yellow pine plank with a similar 1-inch angle bolted to the outer edge.

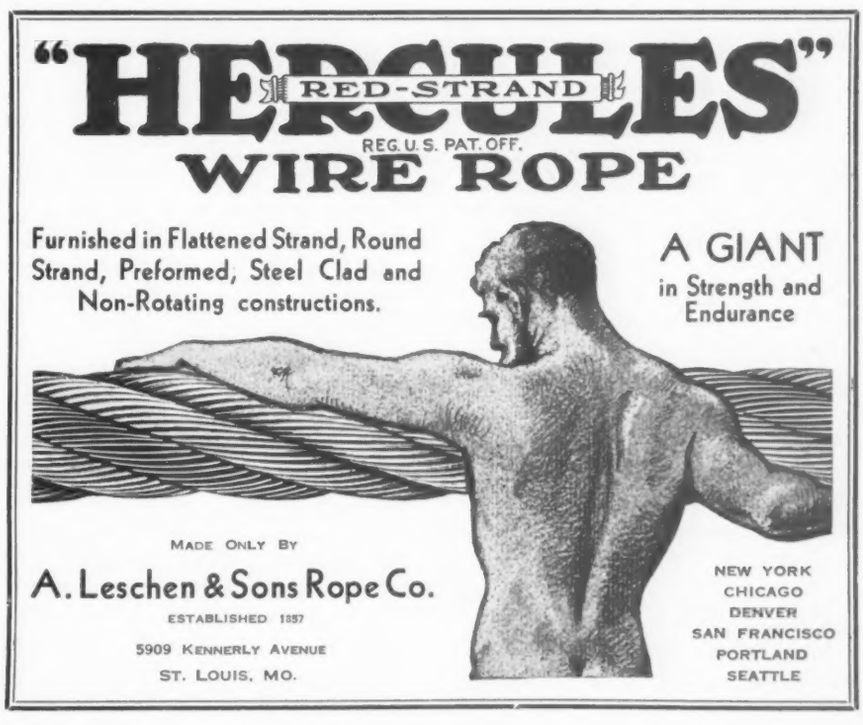
♦

For about 3 months during the year a group of screw machines process heavy stock and operate at full load on the 20-horsepower motor. For the remainder of the year the machines operate on much lighter stock so that the peak load does not exceed 15 horsepower. During this long seasonal off-peak period another lineshaft to a group of small machines is cross-belted to be driven by the 20-horsepower motor in addition to its own load. The 5-horsepower motor on the small group drive is disconnected temporarily. This permits the larger motor to operate at practically full load and higher efficiency the year around.

Merry-Go-Round Speeds Assembly



■ De Soto plant in Detroit employs 23 dollies riding on a single chain conveyor on which front end units are fitted out including radiator shell, grille, fenders, headlamps and trim strips. Fender work is facilitated by a portion raised 18 inches above floor level as shown. The closed track principle conserves space



A.F.A. Prepares Program For Annual Convention

(*Concluded from Page 78*)

Ohio chapter, American Foundrymen's association and Foundry Equipment Manufacturers' association.

Wednesday, May 18

MORNING

Sand Shop Course

Session 2—"Practical Problems of Gray Iron Sand Control."

Apprentice Training

Demonstration at Cleveland Trade school.

Malleable Cast Iron

"Spheroidized Pearlitic Malleable Cast Iron," by Duncan Forbes, Gunite Corp., Rockford, Ill.

"Production of Short Cycle Malleable Iron," by W. D. McMillan, International Harvester Co., Chicago.

"Pearlitic Malleable," by W. E. Benninghoff, Ohio Crankshaft Co., Cleveland.

Steel Castings

"Report of Committee on Coupon Tests," by Chairman J. M. Sampson, General Electric Co., Schenectady, N. Y.

"Low Ductility Values Caused by Over Annealing," by A. P. Gagnebin, International Nickel Co. Inc., Bayonne, N. J.

"Steel Casting Design for the Engineer and the Foundryman," by C. W. Briggs, A. R. Donaldson, naval research laboratories, Washington, and R. A. Gezelius, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Sand Research

"Effects of Different Electrolytes on A.F.A. Clay Determinations," by J. F. Haseman, Cornell university, Ithaca, N. Y.

"What Happens to a Core in a Core Oven," by Jasper Willsea, Willsea Works, Rochester, N. Y.

"Sand Research Committee Report," by Dr. H. Ries, Cornell university, Ithaca, N. Y.

"A Survey of Sand Control in Commercial Foundries," by A. S. Nichols, Illinois Clay Products Co., Chicago.

Annual Business Meeting

Election of officers.
Committee reports.

NOON

Steel division luncheon and roundtable conference.
Apprentice training committee luncheon.

AFTERNOON

Cast Iron Shop Course

Session 3—"Gates and Risers for High Test and Alloyed Cast Iron," by C. C. Brisbois and A. E. Cartwright, Robert Mitchell Co. Ltd., Montreal.

Malleable Shop Course

Session 1—"Practical Metallurgical Problems."

EVENING

Annual dinner of American Foundrymen's association.

Thursday, May 19

MORNING

Sand Shop Course

Session 3—"Practical Problems of Core Room Sand Control."

Malleable Cast Iron

"Factors Influencing Annealing Malleable Iron," by A. L. Boegehold, General Motors Research Laboratory, Detroit.

"Atmosphere Control in Annealing Malleable Iron," by E. G. deCoriolis and R. J. Cowan, Surface Combustion Corp., Toledo, O.

"Design of Conveyor Equipment for Malleabilizing Furnaces," by H. H. Harris, General Alloys Co., Boston.

Materials Handling

"Foundry Maintenance," by Carter Bliss, Scullin Steel Co., St. Louis.

"Tramrail Distribution of Core Sands and Cores," by N. P. Anjesky, Cleveland Tramrail division, Cleveland Crane & Engineering Co., Wickliffe, O.

NOON

Malleable division luncheon and roundtable discussion. Topic—"Annealing Malleable Iron."

AFTERNOON

Foundry Safety and Hygiene

"Silicosis and the Foundry Industry," by Dr. Leonard Greenberg, executive director, division of industrial hygiene, department of labor, State of New York.

Cast Iron Shop Course

Session 4—"Cupola Operation."

Malleable Shop Course

Session 2—"Shop Practice Problems." "Design of Straightening Equipment for Malleable Iron Castings," by C. W. Weedfall, Saginaw Malleable Iron Division, General Motors Corp., Saginaw, Mich.

Welded Pressure Vessels Interest Conference

(*Concluded from Page 69*)

improved cast irons of which there now are many, and the part would have a far better chance to stand up to its duty. It follows that correct arc welding of cast iron demands that the welder imitate methods of a modern foundryman and produce one of the higher strength materials.

The author described some experiments wherein a high carbon steel coated electrode was used. High temperature of deposition in the arc should favor the graphitization of cementite in the molten puddle; to enhance this action, surfaces to be welded were sprayed with copper to a depth of 0.010-inch. It was found, however, that quenching action of the cold base metal was so great as to counteract these favorable graphitizing influences, and a thin zone of cementite occurred over the entire weld surface. Plain cast iron so welded developed about 60 per cent of its original strength of 25,000 pounds per square inch in tension. Oxyacetylene welds made on similar specimens developed full strength; this suggested that "hot welding" or arc welding of preheated specimens, should give a better thermal gradient and cooling rate.

Manufacturers of welding electrodes have given much attention to this problem. Coatings for electrodes have been developed which contain ingredients like iron oxide that aid in rapid melting at low heats and so keep the temperature in the base metal so low as to control the carbon absorption and cementite precipitation. Graphite coatings, some with sodium silicate binder, have also been proposed. Nonferrous alloys and austenitic steels have made acceptable welds. Prof. Schaller knows of no method, however, that will make a weld of approximately the same microstructure as the parent metal—cast iron. The solution lies deeper than the addition of graphitizers to the weld metal, and possibly includes temperature regulation of both weld metal and parent metal.

Wire Group Convenes in Second Regional Meeting

■ Success of the first regional meeting of the Wire association in Pittsburgh last year was duplicated in the same city, April 1, when 226 members and guests of the association spent the day inspecting the newly modernized wire mill at the Monessen works, Pittsburgh Steel Co., and convened in the William Penn hotel in the evening for a technical meeting.

Two papers were presented at this session, one by Dr. S. A. Braley, fellow, Mellon Institute of Industrial Research, Pittsburgh, and the other by B. L. McCarthy, metallurgist, Wickwire-Spencer Steel Co., Buffalo. An address of welcome was made by F. A. Westphal, superintendent, wire mill, Sheffield Steel Corp., Kansas City, Mo., and vice president, Wire association.

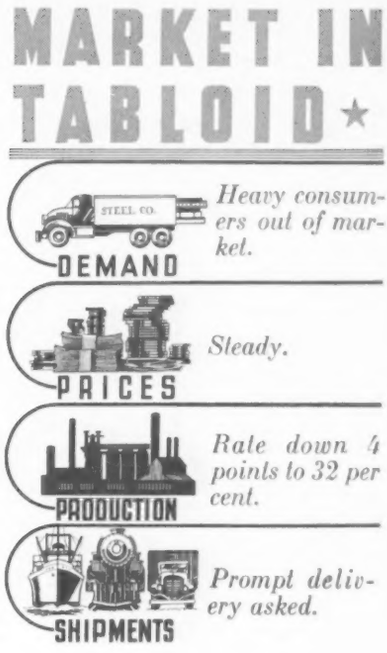
Functions of a wire mill were outlined by Dr. Braley. Emphasizing the importance of galvanizing in a mill, he outlined various problems which must be met in galvanizing steels of different analysis, as well as wire which is to be used for such purposes as cold heading, extruding, fence wire, telephone service, welding and others. Each type requires different physical properties and as a result presents a different problem to the galvanizer.

Dr. Braley also outlined the requirements of a good pickling line in the light of modern developments in pickling technique. In closing, he touched on the newly developments in die lubrication and the importance of these to wire mill men.

Mr. McCarthy's paper was devoted to a broad study of all metals together with their properties and uses. He attempted to show which properties of the various more or less common metals were responsible for their use in certain applications. Cost of refining, rarity, value of properties and other factors were discussed in analyzing the value of metals in commercial applications.

Consumers of Heavy Steel Still Out of Market

Ship Needs Larger; Auto Output Gains; Scrap at New Low



■ GENERAL buying continues to support the market in the absence of tonnage from heavier consumers, with ship tonnage and material for agricultural implements the most promising factors.

Shipbuilding, both private and navy, is taking steady shipments for vessels now on the ways and other ships are coming into the market. American Export Line is about to place four cargo ships, which will require 12,000 tons of steel. A Pittsburgh barge builder will build ten coal barges and four flush deck barges for stock, which will call for 2000 tons of plates.

While the structural market lags some fairly large tonnages are being placed. Westinghouse Electric & Mfg. Co. has awarded 1900 tons for a plant addition at Springfield, Mass.; a bridge at Pittsburgh requiring 5000 tons has been placed; 3600 tons of steel for bridge repairs in New York has been distributed and 1550 tons for a bridge connecting Washington and Idaho has been booked.

Tunnel work at New York is pending, 4500 tons, and bids will be opened June 1 for materials for Shasta dam, in California. This will require 13,000 tons of reinforcing bars, 18,000 tons of gate valves and structurals and 6850 tons of penstocks.

Pig iron consumption shows an increase, some producers finding shipments in March 40 to 50 per cent above previous months.

Freight rate increases are now in effect and delivered prices have been changed little. Consumers were not moved to anticipate the higher rates and buying for that reason has been slight. Some confusion as to various details has been encountered and some orders have been taken at old rates, pending final adjustment.

Railroads obtain small increase in revenues from the higher charges and do not see their way clear to buy much equipment under present financial conditions. Missouri Pacific has distributed 32,400 tons of rails among four mills. Several other western roads have rail inquiries nearly ready to issue but probably tonnages will be kept at the lowest possible point. Central of New Jersey has awarded 2300 tons of rails. Awards of freight cars in March were 680 units, the best of the year. For first quarter the total is 814, which compares with 30,933 bought in first quarter last year and 9582 in first quarter, 1936.

Curtailment of operations in most centers last week resulted in a drop of 4 points in the national rate, bringing it to 32 per cent. Pittsburgh declined 3 points to 29 per cent, Chicago 1.5 points to 31, Eastern Pennsylvania 1 point to 28, Buffalo 2 points to 28, St. Louis 4.1 points to 42.4, Cleveland 6.5 points to 27 and Wheeling 8 points to 33. Youngstown advanced 3 points to 33 and Cincinnati 27 points to 45. There was no change at Birmingham, 66 per cent, New England, 20 per cent and Detroit, 18 per cent.

Steel ingot production in March was 18 per cent greater than the February output, attaining 2,011,840 gross tons, representing 33.84 per cent of capacity. For first quarter total output was 5,447,351 tons, the lowest for any three months since the final quarter of 1934. In first quarter of 1937 production was 14,354,969 tons, at 85.23 per cent of capacity. First quarter output was 22 per cent below that of the last quarter of 1937 and 62 per cent less than first quarter of 1937.

Automobile production made a slight gain, reaching 60,975 units, compared with 57,500 the preceding week. General Motors made 22,430 compared with 20,530, Chrysler 14,075 compared with 14,575, Ford 15,885 against 14,385 and all others a total of 8585 compared with 8010.

General softness in steelmaking scrap following practical absence of buying for domestic or export account, caused prices to decline in both east and west and the composite lost 37 cents, to $12.63, which is 12 cents below the low point of November. This is the lowest figure for this composite since the end of June, 1936, when it touched $12.47. The scrap influence caused the iron and steel composite to lose 9 cents, to $38.62. The finished steel composite is unchanged at $61.70.

Signs are appearing in the British steel market of a revival in demand and the Continent is receiving more inquiries for export. Expectation of an Anglo-Italian agreement rouses hope of increased trade between these countries.

COMPOSITE MARKET AVERAGES

	April 9	April 2	Mar. 26	One Month Ago Mar., 1938	Three Months Ago Jan., 1938	One Year Ago Apr., 1937	Five Years Ago Apr., 1933
Iron and Steel	$38.62	$38.71	$38.75	$38.80	$38.95	$40.39	$27.78
Finished Steel	61.70	61.70	61.70	61.70	61.70	61.45	44.94
Steelworks Scrap..	12.63	13.00	13.21	13.20	13.85	21.27	7.23

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	April 9, 1938	March 1938	Jan. 1938	April 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.45c
Steel bars, Chicago	2.50	2.50	2.50	2.50
Steel bars, Philadelphia	2.77	2.75	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.25	2.25	2.25	2.25
Shapes, Philadelphia	2.465	2.465	2.465	2.455
Shapes, Chicago	2.30	2.30	2.30	2.30
Tank plates, Pittsburgh	2.25	2.25	2.25	2.25
Tank plates, Philadelphia	2.445	2.445	2.445	2.435
Tank plates, Chicago	2.30	2.30	2.30	2.30
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	3.15
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.80
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.50
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	3.25
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.90
Plain wire, Pittsburgh	2.90	2.90	2.90	2.90
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.25
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$37.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	37.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	37.00
Wire rods, No. 5 to 9/32-inch, Pitts.	47.00	47.00	47.00	47.00

Pig Iron

	April 9, 1938	March 1938	Jan. 1938	April 1937
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$25.26
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern del. East. Pa.	25.34	25.34	25.34	25.26
No. 2 fdry., Pittsburgh	25.21	25.21	25.21	25.21
No. 2 fdry., Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.69
No. 2X eastern, del. Phila.	26.215	26.215	26.215	26.135
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	30.34	30.24	30.24	30.04
Gray forge, del. Pittsburgh	24.17	24.17	24.17	24.17
Ferromanganese, del. Pittsburgh	107.77	107.49	107.49	99.79

Scrap

Heavy melting steel, Pittsburgh	$12.75	$13.65	$14.05	$22.75
Heavy melt. steel, No. 2, E. Pa.	11.75	12.75	13.75	19.06
Heavy melting steel, Chicago	11.75	12.20	13.25	20.75
Rails for rolling, Chicago	15.25	15.25	14.90	23.35
Railroad steel specialties, Chicago	13.75	14.25	15.75	23.75

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.25	$4.50
Connellsville, foundry, ovens	5.25	5.25	5.25	5.05
Chicago, by-product foundry, del.	11.00	11.00	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.76c
Philadelphia, del	2.72c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars	2.97½c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.51c
Philadelphia, del	3.47c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars	3.82½c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.12c
New York, delivered	4.16c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars	4.42½c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.21c
Philadelphia, del.	3.32c
New York, del.	3.36c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars	3.62½c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.66c
Philadelphia, del.	3.77c
New York, del.	3.81c
St. Louis	3.68c
Granite City, Ill.	3.65c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del	2.55c
Philadelphia, del.	2.44½c
Boston, delivered	2.68c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific basing points, f.o.b. cars	2.82½c
St. Louis, delivered	2.54c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.52c
Boston, delivered	2.66c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo, delivered	2.37½c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific coast basing pts., f.o.b. cars	2.82½c
St. Louis, del.	2.54c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific coast basing pts., f.o.b. cars	3.02½c
Philadelphia, del	2.77c
Boston, delivered	2.89c
New York, del.	2.81c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo, delivered	2.37½c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.67c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.77c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young....	2.35c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100	0.15 to 0.25 Mo.		0.55
4600	0.20 to 0.30 Mo. 1.50-2.00 Ni.		1.10
5100	0.80-1.10 Cr.		0.45
5100	Cr. spring		0.15
6100	bars		1.20
6100	spring		0.85
Cr. N., Van.			1.50
Carbon Van.			0.85
9200	spring flats		0.15
9200	spring rounds, squares		0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/4-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.72c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plate, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to ⅞-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts, Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2"OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.80	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.80-58.80
6 to 24-in., Chicago	54.80-55.80
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.83
Duluth	39.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to ⅝-inch incl.	47.00
Do., over 5/32 to 41/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.95

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	6.75c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	25.87	.....	.....	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.78	.....
Cincinnati from Birmingham	24.06	.....	23.06	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.15	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		**Charcoal**	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.77
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., ton lot	80.50
Do., 75 per cent	126.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	1.90-2.00
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod plant, frt. all., net ton	142.50
Contract, ton lots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb. f.o.b. mill	0.95
Molybdate, lb. cont. f.o.b. mill	0.80
Technical molybdenum trioxide, 53 to 60% molybdenum, f.o.b. mill	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper—Electro, del. Conn.	Copper—Lake, del. Midwest	Copper—Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
April 2	10.00	10.12½	9.52½	39.12½	39.20	4.50	4.35	4.25	20.00	13.75	35.00
April 4	10.00	10.12½	9.52½	38.75	38.90	4.50	4.35	4.15	20.00	13.75	35.00
April 5	10.00	10.12½	9.52½	38.10	38.25	4.50	4.35	4.15	20.00	13.75	35.00
April 6	10.00	10.12½	9.52½	37.85	38.00	4.50	4.35	4.15	20.00	13.75	35.00
April 7	10.00	10.12½	9.52½	37.90	38.05	4.50	4.35	4.15	20.00	13.75	35.00
April 8	10.00	10.12½	9.52½	38.70	38.85	4.50	4.35	4.00	20.00	13.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.00c *Conn. copper*

Sheets

Yellow brass (high)	16.37½
Copper, hot rolled	18.12½
Lead, cut to jobbers	7.75
Zinc, 100-lb. base	10.00

Tubes

High, yellow brass	19.12½
Seamless copper	18.62½

Rods

High yellow brass	12.37½
Copper, hot rolled	14.62½

Anodes

Copper, untrimmed	15.37½

Wire

Yellow brass (high)	16.62½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	5.50-5.75
*Cleveland	6.25-6.50
*Chicago	5.25-5.50
*St. Louis	5.00-5.25

Heavy Copper and Wire

*New York, No. 1	6.37½-6.62½
*Cleveland, No. 1	7.00-7.25
*Chicago, No. 1	6.75-7.00
*St. Louis	6.50-6.75

Composition Brass Borings

*New York	5.50-5.75

Light Copper

*New York	4.37½-4.62½
Cleveland	5.25-5.50
*Chicago	5.00-5.25
*St. Louis	4.75-5.00

Light Brass

Cleveland	3.25-3.50
*Chicago	3.25-3.50
*St. Louis	3.00-3.25

Lead

New York	3.50-3.75
Cleveland	3.25-3.50
Chicago	3.00-3.25
*St. Louis	2.75-3.00

Zinc

*New York	1.75-1.87½
Cleveland	1.75-2.00
*St. Louis	1.50-1.75

Aluminum

*Borings, Cleveland	4.75-5.00
*Mixed cast, Cleve.	6.75-7.00
*Clips, soft, Cleve.	11.25-11.50
*Mixed cast, St. L.	7.00-7.25

SECONDARY METALS

Brass ingot, 85-5-5-5, lcl.	10.25
*Stand, No. 12 alum.	15.25-15.75

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled No. 10	Sheets Hot Roll Ann. No. 24	Sheets Galv. No. 24
Boston	4.26	4.46	5.46	4.11	4.10	5.76	4.21	4.96	5.16
New York (Metropolitan)	4.16	4.36	4.36	4.02	3.99	5.62	4.11	4.50	5.00
Philadelphia	4.03	4.13	4.63	3.92	3.92	5.25	4.03	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.20	4.40	4.65	4.10	4.10	5.70	4.15	4.75	5.40
Buffalo	3.90	4.25	4.25	3.95	3.80	5.55	4.00	4.83	5.38
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.19	4.19	3.89	3.89	5.49	3.94	4.69	5.34
Detroit	3.935	4.185	4.185	3.95	3.95	5.55	3.935	4.685	5.40
Cincinnati	4.07	4.29	4.29	3.99	3.99	5.59	4.04	4.79	5.44
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.00
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.12	4.37	4.37	4.02	4.02	5.62	4.12	4.87	5.52
Kansas City	4.34	4.59	4.59	4.24	4.24	5.84	4.10	4.85	5.50
Memphis	4.35	4.55	4.55	4.25	4.25	5.91	4.30	5.05	5.70
Chattanooga	4.25	4.45	4.45	4.15	4.15	5.98	4.20	4.10	4.70
Tulsa, Okla.	4.89	5.14	5.14	4.79	4.79	6.39	4.89	5.64	6.29
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	5.96	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.15	6.55	4.25	4.25	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.55

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	3100
Boston	3.86	4.71	4.56	8.00	6.55	6.30	8.40	9.02	7.57
New York	3.96	4.61	4.36	7.84	6.39	6.14	9.54	9.04	7.59
Philadelphia	3.88	4.56	4.28	....	....	....	9.49	....	....
Baltimore	....	4.50	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.82	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	..	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.78	4.30	4.085	7.89	6.44	6.19	7.74	8.88	7.43
Cincinnati	....	4.52	4.07	7.91	6.46	6.21	9.31	8.92	7.47
Chicago	3.91	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.83	4.25	7.95	6.50	9.03	9.63	9.23	7.78
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	4.01	4.57	4.32	7.97	6.52	6.27	8.37	8.97	7.52
Kansas City	4.37	4.79	....	....	....	....	....	....	....
Memphis	....	4.86	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.34	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, April 7

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$27.28 5 10 0	$18.09	2 5 0
Basic bessemer	....	.....	.....
Hematite, Phos. .03-.05	32.24 6 10 0*	17.89	2 4 6
Billets	$39.06 7 17 6	$43.22	5 7 6
Wire rods, No. 5 gage	55.92 11 5 6	39.17	4 17 6
Standard rails	$50.22 10 2 6	$46.23	5 15 0
Merchant bars	2.61c 11 15 0	1.90c	5 5 0
Structural shapes	2.36c 10 12 6	1.77c	4 17 6
Plates, †¼ in. or 5 mm.	2.57c 11 11 3	2.23c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	3.11c 14 0 0	2.82c	7 15 0°
Sheets, gal., 24 ga., corr.	3.72c 16 15 0	3.45c	9 10 0
Bands and strips	2.94c 13 5 0	1.77c	4 17 6
Plain wire, base	4.33c 19 10 0	2.23c to 2.64c	6 2 6 to 7 5 0
Galvanized wire, base	5.16c 23 5 0	2.85c to 2.95c	7 17 6 to 8 2 6
Wire nails, base	4.11c 18 10 0	2.54c to 2.72c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 5.59 1 2 6	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$27.03	5 9 0(a)	$17.24	563.50	$20.22	600	$25.30 63
Basic bess. pig iron	24.80	5 0 0(a)	.....	.....	.....	...	27.91 (b) 69.50
Furnace coke	8.06	1 12 6	5.78	189	7.25	215	7.63 19
Billets	39.06	7 17 6	25.70	840	32.35	960	38.75 96.50
Standard rails	2.25c	10 2 6	1.61c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.54c	11 9 0	1.51c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.45c	11 0 6	1.48c	1,055	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.60c	11 14 3	1.89c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.50c	15 15 0§	2.19c	1,565‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.11c	18 10 0	3.15c	2,250	4.50c	3,000	6.66c 370
Plain wire	4.33c	19 10 0	2.32c	1,660	2.48c	1,650	3.11c 173
Bands and strips	2.71c	12 4 0	1.69c	1,210	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed.

**Gold pound sterling carries a premium of 64.85 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Birmingham, No. 2	9.00
Bos. dock No. 1 exp.	12.50-13.00
N. Eng. del. No. 1	12.50
Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	10.00-10.50
Chicago, No. 1	11.50-12.00
Cleveland, No. 1	11.00-11.50
Cleveland, No. 2	10.00-10.50
Detroit, No. 1	6.50- 7.00
Eastern Pa., No. 1	14.00
Eastern Pa., No. 2	11.50-12.00
Federal, Ill.	9.75-10.25
Granite City, R. R.	11.00-11.50
Granite City, No. 2	9.75-10.25
Los Angeles, No. 1	13.50-14.00
Los Angeles, No. 2	12.00-12.50
New York, No. 1	†11.00
N. Y. dock No. 1 exp.	12.50
Pitts., No. 1 (R. R.)	14.25-14.75
Pitts., No. 1 (dlr.)	12.50-13.00
Pittsburgh, No. 2	11.50-12.00
St. Louis, R. R.	11.00-11.50
St. Louis, No. 2	9.75-10.25
San Francisco, No. 1	10.00
Seattle, No. 1	8.00
Toronto, dlrs. No. 1	10.00
Valleys, No. 1	12.00-12.50

COMPRESSED SHEETS

Buffalo	10.50-11.00
Chicago, factory	10.25-10.75
Chicago, dealer	9.50-10.00
Cleveland	10.50-11.00
Detroit	8.25- 8.75
E. Pa., new mat.	14.00
E. Pa., old mat.	9.50
Los Angeles	12.50-13.00
Pittsburgh	12.50-13.00
St. Louis	6.75- 7.25
Valleys	11.00-11.50

BUNDLED SHEETS

Buffalo, new	10.50-11.00
Buffalo, old	9.00- 9.50
Cincinnati, del.	8.00- 8.50
Cleveland	7.50- 8.00
Los Angeles	11.00-11.50
Pittsburgh	11.50-12.00
St. Louis	6.00- 6.50
Toronto, dealers	7.00

SHEET CLIPPINGS, LOOSE

Chicago	7.25- 7.75
Cincinnati	4.50- 5.00
Detroit	5.25- 5.75
†Los Angeles	3.75- 4.00
St. Louis	5.00- 5.50

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	17.00-17.50
Chicago (3 ft.)	14.50-15.00
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	16.00-16.50
Detroit	13.50-14.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	17.25-17.75
St. Louis, 2 ft. & less	14.00-14.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	14.00-14.50
Chicago	11.50-12.00
Cleveland	16.00-16.50
Pittsburgh	15.25-15.75
St. Louis	12.00-12.50
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†8.25- 8.50
Buffalo	11.00-11.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	5.50- 6.00
Detroit, net	7.50- 8.00
Eastern Pa.	12.00-12.50
New York, fdry.	†8.00- 8.50
St. Louis	7.00- 7.50
Toronto, deal'rs, net	9.00

SPRINGS

Buffalo	15.50-16.00
Chicago, coil	16.00-16.50
Chicago, leaf	14.00-14.50
Eastern Pa.	16.50-17.00
Pittsburgh	17.00-17.75
St. Louis	14.50-15.00

ANGLE BARS—STEEL

Chicago	13.50-14.00
St. Louis	12.00-12.50

RAILROAD SPECIALTIES

Chicago	13.50-14.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	19.50-20.50
Eastern Pa., crops	18.00-18.50
Pittsburgh, crops	17.00-18.00

FROGS, SWITCHES

Chicago	11.50-12.00
St. Louis, cut	12.00-12.50

SHOVELING STEEL

Federal, Ill.	9.75-10.25
Granite City, Ill.	9.75-10.25
Los Angeles	15.00-16.50
Toronto, dealers	8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	8.50- 9.00
Cincinnati, No. 2	8.50- 9.00
Eastern Pa., No. 1	15.00-15.50
St. Louis, No. 1	8.00- 8.50
St. Louis, No. 2	10.75-11.25
Toronto, No. 1 dlr.	16.00

SPECIFICATION PIPE

Eastern Pa.	14.00-14.50
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	10.00-10.50
Chicago, No. 1	10.00-10.50
Cincin., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	6.50- 7.00
Detroit, No. 1, new	6.50- 7.00
Valleys, new, No. 1	11.00-11.50
Toronto, dealers	7.00

MACHINE TURNINGS (Long)

Birmingham	6.00- 7.00
Buffalo	5.75- 6.25
Chicago	6.00- 6.50
Cincinnati, dealers	3.00- 3.50
Cleveland	6.50- 7.00
Detroit	3.50- 4.00
Eastern Pa.	7.00- 7.25
Los Angeles	4.00- 4.25
New York	†3.50
Pittsburgh	7.00- 7.50
St. Louis	3.75- 4.25
Toronto, dealers	7.00
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†1.85
Buffalo	6.00- 6.50
Cincinnati, dealers	2.00- 2.50
Cleveland	6.50- 7.00
Eastern Pa.	6.50
Detroit	4.00- 4.50
New York	†3.00-3.50
Pittsburgh	6.00- 6.50
Toronto, dealers	7.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†6.00- 6.50
Bos. dist. for mills	†6.50
Buffalo	6.00- 6.50
Chicago	5.25- 5.75
Cincinnati, dealers	2.50- 3.00
Cleveland	6.50- 7.00
Detroit	4.00- 4.50
E. Pa., chemical	11.00-12.00
New York	†3.50-4.00
St. Louis	3.25- 3.75
Toronto, dealers	7.50

PIPE AND FLUES

Cincinnati, dealers	5.50- 6.00
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	6.00- 6.50
Eastern Pa.	12.50
New York	†8.00- 8.50
St. Louis	8.00- 8.50

FORGE FLASHINGS

Boston district	†6.25
Buffalo	10.00-10.50
Cleveland	10.50-11.00
Detroit	5.75- 6.25
Los Angeles	9.00
Pittsburgh	11.50-12.00

FORGE SCRAP

Boston district	†6.25
Chicago, heavy	14.50-15.00

ARCH BARS, TRANSOMS

St. Louis	13.00-13.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	10.00-10.50
Chicago, elec. fur.	10.50-11.00
Eastern Pa.	11.50-12.00
St. Louis	8.50- 9.00
Toronto	8.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	16.00-16.50
Boston district	†14.00
Chicago, net	17.00-17.50
Eastern Pa.	21.50-22.50
St. Louis	17.50-18.00

SHAFTING

Boston district	†14.00
New York	†15.00-15.50
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†10.00
Buffalo, steel	15.50-16.00
Chicago, iron	13.00-13.50
Chicago, rolled steel	14.00-14.50
Cincinnati, iron	14.00-14.50
Eastern Pa., iron	15.50
Eastern Pa., steel	16.50-17.00
Pittsburgh, iron	14.50-15.00
Pittsburgh, steel	17.00-17.75
St. Louis, iron	11.50-12.00
St. Louis, steel	14.50-15.00

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2	12.00
N. Eng. del. textile	14.00-14.50
Buffalo, cupola	13.00-13.50
Buffalo, mach.	14.00-14.50
Chicago, agri. net	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net	11.50-12.00
Cincin., mach. cup.	10.50-11.00
Cleveland, mach.	17.00-17.50
Eastern Pa., cupola	15.50
E. Pa., mixed yard	12.50-13.00
Los Angeles, net	13.50-14.00
Pittsburgh cupola	15.50-16.00
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, No. 1	10.00-10.50
St. L., No. 1, mach.	12.00-12.50
Toronto, No. 1, mach., net	12.50

HEAVY CAST

Boston dist. break.	†9.00
N. Eng., del.	11.50-12.00
Buffalo, break	11.00-11.50
Cleveland, break.	14.00-15.00
Detroit, break.	10.00-10.50
Detroit, auto net	11.00-11.50
Eastern Pa.	14.00-14.50
Los Ang., auto, net	13.00-13.50
New York, break.	†10.50-11.00
Pittsburgh, break.	12.50-13.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	16.00
Buffalo	13.50-14.00
Chicago, R. R.	13.50-14.00
Cincin., agri. del.	10.00-10.50
Cleveland, rail	15.50-16.00
Detroit, auto	10.00-10.50
Eastern Pa., R. R.	15.50-16.00
Los Angeles	17.50-18.00
Pittsburgh, rail	14.25-14.75
St. Louis, R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	15.00-15.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	13.50-14.00

LOCOMOTIVE TIRES

Chicago (cut)	14.00-14.50
St. Louis, No. 1	12.00-12.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	13.50-14.00
Eastern Pa.	17.50-18.00
Pitts. (lt. & hvy.)	17.00-18.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty paid nom.	21.00-22.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	nom. 45.00
So. African, 50-52%	nom. 45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 88

Pittsburgh—Galvanized sheet orders are holding up fairly well, but incoming specifications on common black and full finished sheets continue disappointing. The galvanized rate is estimated at about 37 per cent of capacity, and common sheet operations, although at the highest point since mid-November, are still under 35 per cent. Automotive business is still lacking and other sheet business, although slowly developing, does not represent sufficient tonnage to enable mills to operate on an economical schedule.

Cleveland — New business has failed to improve at the March rate. Current requirements are limited to small miscellaneous tonnages for prompt delivery from stove, refrigerator and other sources.

Chicago — Sheet demand is fairly steady at a low rate, supported principally by miscellaneous consumers and jobbers. Poor requirements of the automotive industry are in contrast to fairly heavy consumption by farm equipment builders.

Boston—Sheet buying is mostly in small orders placed through jobbers, with the number of orders slightly more numerous. There has been no broader demand from larger industrial consumers, except in spots where a few producers of consumer goods are experiencing a mild seasonal improvement. Such users buy hand-to-mouth. Most stamping, small tank and sheet metal shops buy sparingly. Delivered prices on all finishes are up an average of three cents per 100 pounds under the new freights.

New York — Sheet business, in line with demand for certain other major steel products, is flattening out here, following a fair spurt last month. Last month's gain, in fact, was percentagewise, quite substantial, with some sellers doubling sales of the preceding month. However, total volume was well below average for the period.

Galvanized sheets, normally the best moving sheet product in this district, due primarily to building demands, still heads the list apparently, with specifications also coming out in moderate volume for air conditioning equipment. Enameled sheets are moving relatively well for stove manufacturers.

Interestingly, there has been quite a spurt in stove tonnage recently, while refrigerator steel has taken a definite drop.

Philadelphia — Sheet sellers are encouraged over the fact that incoming business, mostly building stocks, shows definite improvement. One sheet mill, closed for the past four weeks, will run all this week. No further releases are reported by leading automotive interests, however, and little is expected before work on new models gets under way. Radio and stovemakers have contributed little tonnage.

Effective April 6, Philadelphia delivered prices on sheets advanced 2 cents per hundred pounds as a reflection of the freight rate advance. The rate now is 32 cents per hundred compared with 29 cents prior to the 1 cent rise which became effective early in December in Pennsylvania.

St. Louis — There has been a steady liquidation of consumer sheet inventories, which is reflected in a fair volume of prompt purchasing. Advance requirements, however, are apparently being neglected, particularly by the lesser consuming group. Demand for enameling stock holds up well, with most liberal tonnages, relatively, being taken by refrigerator and stove manufacturers. As has been the case for some time,

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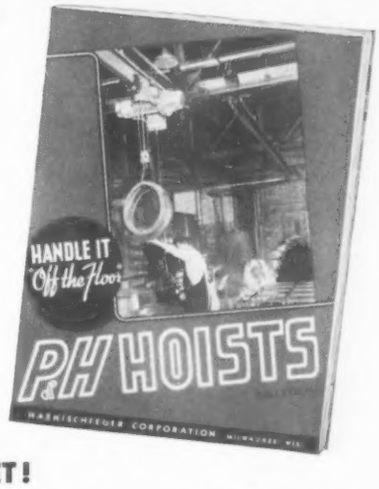

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stamping concerns have been buying conservatively.

Cincinnati — Sheet demand is fairly steady, holding close to 35 per cent of capacity in absence of heavy releases from auto manufacturers. Miscellaneous requirements are sustained in volume comparable to last month. Stovemakers are taking heavier shipments to meet seasonal runs, counteracted in part by a tapering in the refrigerator field. Activity in galvanized continues a bright market phase.

Birmingham, Ala.—Little change is noted in demand for sheets, following slight increase of several weeks ago. Roofing continues dull but demand for manufacturers' sheets leads in this line of products.

Strip

Strip Prices, Page 89

Pittsburgh — Little change has been reported in the strip market, which lags behind other finished steel divisions. Production of both hot and cold-rolled strip remains around 20 per cent. The little progress reported in work on 1939 models among automotive interests indicates it will be several months before demand will be felt for strip in these lines.

Cleveland — Buying continues restricted to small miscellaneous tonnages, at about the rate in the latter part of March. Inventories among many consumers are at new low levels but no forward buying has resulted, due to current low operations.

Chicago — Strip demand has leveled off and in the absence of anticipated improvement in automotive needs, only minor gains are looked for the next several weeks. Most consumers have adjusted stocks to current needs and are ordering small lots for prompt use.

Boston — Without help from the automobile industry, narrow cold strip buying has improved slightly, miscellaneous consumers placing more orders and in a few instances a marked increase in tonnage per order is noted. Demand is still spotty, however, and some producers have experienced little pickup.

New York — Scattered shading in narrow cold strip prices is more prevalent with some producers meeting jobber and slit sheet competition. This development is not general, but is a disturbing influence. While not materially changed, demand is slightly better despite the fact numerous volume consuming industries are releasing a minimum of tonnage. Orders are for miscellaneous fill-in needs with finishing mill operations unchanged, few doing better than 30-35 per cent weekly. Hot strip buying continues slack, rerollers specifying for replacement only as a rule.

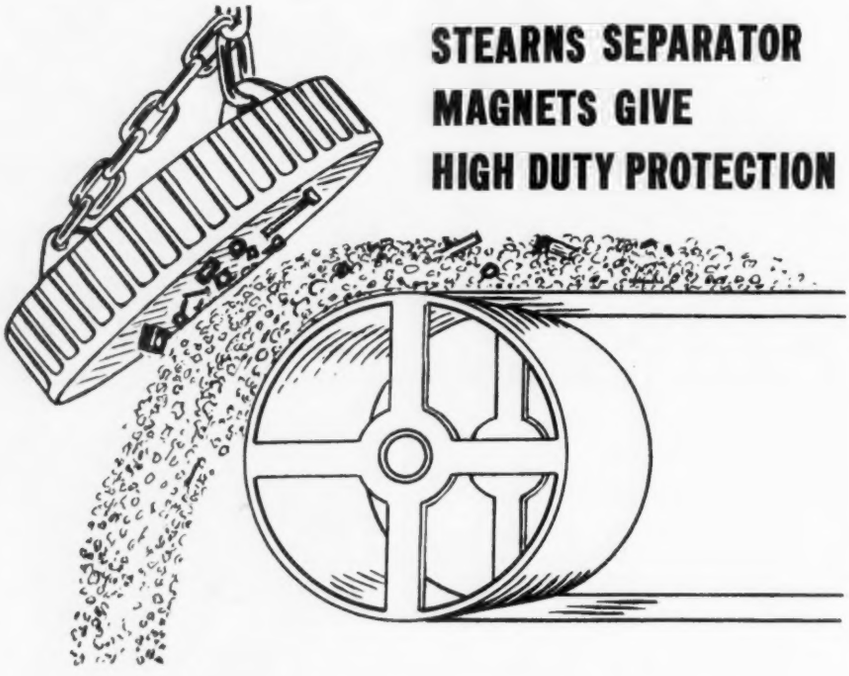
Philadelphia — Narrow strip business continues to improve slightly but prospects are less promising than a few weeks ago. Prices are fairly steady.

Tin Plate

Tin Plate Prices, Page 88

Pittsburgh — Incoming specifications for tin plate are somewhat disappointing. Current orders indicate stocks are still somewhat high in the hands of can producers and export demand has slowed. Inasmuch as there were little carry-over stocks in canned corn and tomatoes, better specifications are expected when can companies start on orders for these crops.

New York — Tin plate sellers anticipate improved specifications this month, particularly with the pea pack improvement and with canmakers' stocks, carried over from last year, steadily being reduced.



STEARNS SEPARATOR MAGNETS GIVE HIGH DUTY PROTECTION

STEARNS High Duty Safety Suspended Magnets have been used successfully for many years in special separation applications requiring the elimination of tramp iron from various kinds of ores and other conveyed material. They have wide use in protecting crushers in quarry operations, over coal conveyors and in a variety of fields where the product must be free from tramp iron.

STEARNS suspended magnets are wound for continuous duty, low cost operation and are designed to prevent overheating. Various sizes and shapes are available to suit your individual requirements.

Consult magnetic headquarters for an efficient, economical solution to your problem.

Write for STEARNS Bulletin No. 25

STEARNS MAGNETIC MFG. CO.

Formerly Magnetic Mfg. Co.

SEPARATORS DRUMS ROLLS CLUTCHES BRAKES MAGNETS

HIGH STEARNS DUTY

LARGEST EXCLUSIVE BUILDERS OF MAGNETIC EQUIPMENT

650 So. 28th Street **Milwaukee, Wis.**

Sellers generally, however, look for releases to continue under last year's rate.

Plates

Plate Prices, Page 88

Philadelphia — Pusey & Jones, Wilmington, Del., has placed 1600 tons of plates for an army dredge with four mills and about 900 tons of shapes with two interests. Moderate releases are also reported for navy work. Railroads recently have placed only a few odd lots and tank work is generally disappointing. Export demand is more active but prices are unattractive.

Award of a 1400-ton gas holder for Connecticut Light & Power Co. at Waterbury, Conn., was reported to Stacey Mfg. Co., Cincinnati, in the Philadelphia plate market in STEEL, April 4. This was in error, the contract being to Stacey Brothers Gas Construction Co., Cincinnati.

Kendall Refining Co., Bradford, Pa. has awarded two tanks to Chicago Bridge & Iron Co., Chicago, involving 240 tons of plates.

Philadelphia delivered prices on plates are not affected by the latest upward revision in freight rates since the full 10 per cent rise was applied early in December. The quotation continues at 9½ cents over the Coatesville, Pa. base of 2.35c.

Pittsburgh—A slight seasonal improvement has been noted in the plate market, with construction projects more numerous as spring advances. Dravo Corp., Pittsburgh, has announced plans for immediate construction for stock of ten coal barges and four flush deck barges with cargo boxes. The total steel for this project will be about 2000 tons.

Cleveland — Plate sellers note little improvement, with most inquiries limited to small miscellaneous requirements. Some tonnage is required for small structural projects. Prices are steady.

Chicago — Plate sales are slow, fairly active demand from tank builders failing to offset the lag in purchases by railroads. Seasonal improvement in requirements of structural fabricators generally is lacking. Plate deliveries continue one week to ten days.

Boston — With larger users of plates, notably railroads, specifying little tonnage, buying, which is light, is centered around miscellaneous needs with orders small. For the long pull shipyard needs loom encouragingly. The largest Maine yard, Bath Iron Works, has contracts to maintain capacity operations for two years.

New York — Bids will be opened May 17 by the United States Maritime commission on four cargo vessels for the American Export Line Inc., New York, requiring approximately 12,000 tons of hull steel. American Bureau of Shipping, this city, reports a further increase in shipbuilding, 12 more vessels of 100 tons or more being on the ways April 1 than at the beginning of March. The gross tonnage of the 147 vessels under construction April 1 aggregated 406,895 tons, against 402,385 for the 135 vessels under construction March 1.

Miscellaneous plate tonnage appears lighter than a week ago with railroad buying negligible and with specifications from oil companies at the moment somewhat lighter than recently. Due to change in freight rates April 6 on carlots, the delivered price on plates here is 2.55c, up 1 cent.

Seattle—Shops have some repair jobs and small contracts but activity is much less than a year ago. Steel

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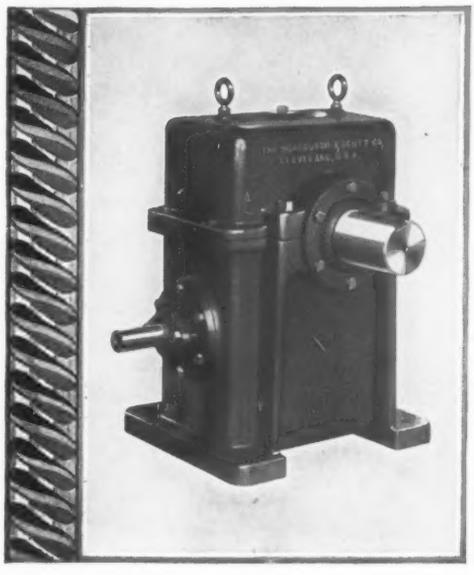


WORM GEAR DRIVES

in ratios up to 100 to 1 in Single Reductions

•

10,000 to 1 in Double Reductions

★ It's next door to direct drive . . . with just two moving parts . . . the worm . . . the gear. That's all there is to the Horsburgh & Scott Worm Gear Speed Reducer. The efficiency is remarkably high, due to such features as hardened and accurately ground worm, carefully chosen gear bronze, accurate alignment and self-lubrication. It is an extremelv simple, compact and rugged right-angle drive . . . representing correct design and the highest type of precision manufacture.

Send for this valuable 448 page catalog that illustrates and describes a complete line of all types of Speed Reducers and Gears.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.

Behind the Scenes with STEEL

The Whiteys

■ STEEL was and always is the first publication to run those Maurath welding rod ads featuring "Whitey Jr.", the doll-sized likeness of Whitey Maurath himself, and you've undoubtedly noticed the monthly appearance of Whitey Jr. in these pages. Anyway, we were particularly glad to hear of the recent west coast adventures of the two Whiteys. Out in Los Angeles for the Western Metal Congress, Whitey became lonesome for Jr.

Whitey the Younger

one night, so wired to Cleveland for him. The puppet arrived by plane the next morning in time to attend the opening session and create wholesale disturbance and distraction from the lectures. Newspaper reporters cornered the Whiteys later at the Hotel Biltmore and took photographs. Picture and story next morning made the front page of the Los Angeles Times. Then Whitey (Sr.) gave a talk before the Los Angeles ad club, describing his unique business promotion setup. Later Edgar Bergen was contacted with reference to putting on a 15-minute skit with Whitey Jr. for the benefit of the Maurath friends. Bergen was willing to oblige for $1000—and probably still is. So instead the Whiteys trudged over to the Troc in Hollywood, where Jr. again hogged attention and was fondled by such performers as Sonja Henie, Myrna Loy and Wallace Beery. Now the master and his puppet are back in Cleveland for two weeks, before returning to the coast again. Donald Duck is worried over his movie contract and reported to be jealously gnashing his teeth, if he has any.

Welding

■ The broad field of welding, as you will note in this issue, is now departmentalized in the manner of the many other fields covered by STEEL. As usual the latest developments, processes and methods in welding will be presented but now under the Welding label head.

Pun

■ We're not sure but we suspect the eds. who write the heds. for the feature cuts in STEEL have gone in for a bit of old fashioned punning. At least, the heading for the feature cut on page 73 this week seems to suggest it, and we're going to grille the boys about it later.

Monopoly

■ From Ahmed A. Fazelbhoy, 55 Canning street, Calcutta, comes a request that we scarcely can overlook. Says the Fazelbhoy: "We desire to be the subscriber to your much esteemed paper and we shall be glad to learn the rate of your annual subscription. We shall thank you to send us a specimen copy for our inspection."

The circulation dept. reports that it is contacting our present subscriber to see if that person is willing to relinquish his position in favor of Mr. Fazelbhoy.

—SHRDLU

storage water tanks are planned by several towns in the Pacific Northwest, Port Orchard, Wash., has called bids April 25 for a 125,000-gallon ellipsoidal tank, on an 84-foot tower. Seattle has postponed for 60 days or more action on proposed crosstown supply line, involving 1600 tons of plates.

Plate Contracts Placed

240 tons, two 30,000-barrel tanks, Kendall Refining Co., Bradford, Pa., to Chicago Bridge & Iron Co., Chicago.

Plate Contracts Pending

Unstated tonnage, one steel fuel oil barge, 60 x 20 by 4.5 feet; bids April 19, U. S. engineer, Nashville, Tenn.

Bars

Bar Prices, Page 88

Pittsburgh—Orders for steel bars continue at about the same pace and little hope is held for improvement in April over March. Large buyers are still quiet and miscellaneous small manufacturers are supplying most of the current business.

Cleveland — Demand for carbon and alloy steel bars is limited to miscellaneous tonnages from normally smaller consumers. Specifications from auto partsmakers have failed to show improvement, reflecting unusually low operations of auto builders. Railroad buying has also failed to show improvement. Prices remain firm.

Chicago — Steel bar demand has leveled off in most directions though heavier orders have appeared from farm equipment manufacturers the past two weeks. Automotive needs are slow and little additional business for production of 1938 models is in prospect. Railroad purchases for miscellaneous repairs are scant. Steady demand from jobbers accompanies fairly active movement of bars from store.

Boston — Commercial steel bar buying is irregular and light. Releases by jobbers have slackened following some mild replacement buying. Cold-finished specifications are steady, but in small volume. Business in alloy bars is about maintained and as is the case with forging material is not heavy.

New York — Bar prices delivered here in carlots are up 2 cents per 100 pounds to 2.81c, as a result of the change in freight rates April 6. Bar demand is not up to the volume of a week ago, which at best was below normal. Cold drawn bars are also moving more slowly, demand lacking requirements of certain builders of special machinery which

contributed to the business a fortnight ago. With bearing manufacturers operating at possibly the lowest ebb in weeks, alloy bar tonnage is likewise being adversely affected.

Philadelphia — Further slight improvement is noted in merchant bars, mostly from miscellaneous consumers, although warehouses also are contributing occasional carlots. Alloy bars are moving relatively better than carbon steel. Cold-drawing mills are still operating at a low rate. Prices are steady.

Birmingham, Ala. — Slight improvement in bar orders is shown, with agricultural implement manufacturers' demand still outstanding.

Pipe

Pipe Prices, Page 89

Pittsburgh — Tubular goods showed slight improvement, largely because of the higher freight rates. Incoming orders are slow and outlook is cloudy. Oil country products are accounting for the best part of present production.

Cleveland — Steel pipe requirements are limited to small tonnages. Jobbers report stock turnover substantially unchanged from the last two weeks of March. Demand for cast pipe is expected to improve gradually throughout April, reflecting increased WPA spending for municipal water extension systems and similar projects. Prices are unchanged.

Boston — Cast pipe buying approximates 1000 tons, mostly in 100 to 200-ton lots, with the bulk going to the district foundry. Several blanket contracts for the remainder of 1938 requirements have also been placed while releases against tonnage placed earlier in the year are heavier. Most recent buying has been for small diameters, 6-inch predominating. The Florence, N. J., foundry booked 225 tons for Waltham, Mass. Steel and wrought iron pipe, affected by dull operations, moves in small lots, but the former is in steady volume.

New York — Cast pipe inquiries are slightly heavier, but still seasonally low. Several projects on Long Island are out for estimates, taking a substantial tonnage, notably one at Massapaqua to be placed through a contractor. New York is expected to close on 1600 tons, recently bid, this week. It now appears about 6000 tons will be required for the Philippines, recently figured instead of 4200 tons, there being a second inquiry. Higher freight rates have little or no effect on delivered prices in this immediate territory, most deliveries being made by truck.

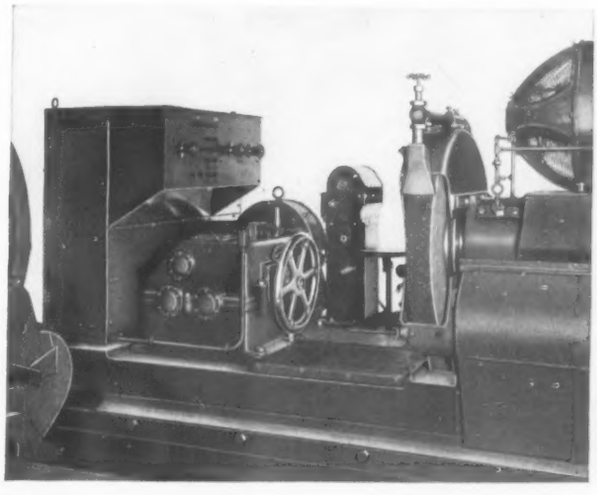
Birmingham, Ala.—New orders for pipe have not yet been received on a large scale, but producers still expect awards on several inquiries. Pipe plants are operating on a 40 per cent basis, averaging three days a week.

San Francisco — Cast iron pipe lettings were limited to lots of less than 60 tons and awards so far this year aggregate only 8693 tons, against 11,644 tons for corresponding period in 1937. Bids have just been called for, to be opened on April 18, for 433 tons of 8-inch, Class 250 pipe for Los Angeles.

Seattle — Prospects are unpromising for cast iron pipe dealers, transite having been selected in preference in a number of instances.

Cast Pipe Placed

225 tons, 6 to 12-inch, Waltham, Mass., to R. D. Wood & Co., Florence, N. J.
215 tons, 6 to 12-inch, Haverhill, Mass., to Warren Pipe Co., Everett, Mass.
130 tons, 6-inch, Marlboro, Mass., to Warren Pipe Co., Everett, Mass.
105 tons, 6-inch, Greenfield and North Adams, Mass., to Warren Pipe Co., Everett, Mass.
100 tons or more, various sizes, blanket contract, Gloucester, Mass., to Warren Pipe Co., Everett, Mass.



FARREL ROLL GRINDERS
Have Smooth, Vibrationless Carriage Traverse

An important factor in grinding rolls to the accuracy and finish demanded by modern rolling mill practice is the smooth, positive traverse, steadiness of travel and the smoothly accurate reverse of the carriage carrying the grinding wheel.

In the Farrel Heavy Duty Roll Grinder this is assured by the improved design of carriage drive. The carriage is driven by a reversing motor through accurately generated Farrel-Sykes continuous tooth herringbone gears and a worm reduction to a worm meshing with the rack on the bed, the smoothest type of mechanical drive known for machine tool carriages. The gears are mounted in anti-friction bearings.

Reversal of the carriage traverse is accomplished electrically, eliminating mechanical reversing clutches. A variable speed motor and a two-speed drive provide a wide, variable speed range for every grinding condition. Speed change and point of reversal of the carriage are automatic and require no further attention on the part of the operator. Oil bath lubrication is provided for the gears and bearings of the carriage drive and for the worm meshing with the rack on the bed.

The low-cost, high-output, high-accuracy performance of Farrel Heavy Duty Roll Grinders is the result of a combination of design features which are fully described in Bulletin No. 111. A copy will be sent free on request.

FARREL
FARREL-BIRMINGHAM COMPANY, Inc.
ANSONIA, CONN.
New York • Buffalo • Pittsburgh • Akron • Chicago • Los Angeles

100 tons, 6-inch Bath, Me., to Central Foundry Co., Birmingham, Ala.
100 tons, 12-inch, Canton, Mass., to Warren Pipe Co., Everett, Mass.
100 tons or more, blanket contract, Andover, Mass., to Warren Pipe Co., Everett, Mass.
100 tons, various sizes, Crotona park, New York, to Donaldson Iron Works, Emaus, Pa.

Steel Pipe Placed

600 tons, 55-inch new water system, Syracuse, N. Y., awarded to Bethlehem Steel Co., Lackawanna, N. Y.

Cast Pipe Pending

433 tons, 8-inch, Class 250, San Francisco; bids April 18.
300 tons, 4 to 10-inch, Monroe, Wash.; U. S. Pipe & Foundry Co., Burlington, N. J., low.
250 tons, Lancaster, Mass.; bids in.
225 tons, 6 to 10-inch, class 150, Natick, Mass.; bids in.
200 tons, 8-inch, Queen Anne extension, Seattle; bids about April 14.
180 tons, 4 to 8-inch, Tenino, Wash.; bids expected soon.
110 tons, 20-inch, 105 lengths, New York, bids April 14, department of purchase.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 89

Bolt, nut and rivet specifications are steady but light. Requirements of farm equipment manufacturers still provide one of the principal outlets, with railroads one of the dullest of the leading customers. Occasional gains are shown in demand from miscellaneous users but jobbers have increased their specifications little the past 30 days.

Wire

Wire Prices, Page 89

Pittsburgh — Demand for merchant wire, especially in the fencing division, continues good, with production running as much as four weeks behind orders in some plants. Jobber orders continue to appear in fair volume as a result of subnormal stocks in preparation for the spring buying season. Wire rod business has still failed to appear in volume, while general manufacturers' wire products have shown some increase, although little hope is held for better business soon.

Cleveland — Demand for merchant wire products continues the lone bright spot in the current market. Requirements for manufacturer's wire have failed to show expected improvement, due primarily to the lack of releases from automotive sources. Prices are unchanged.

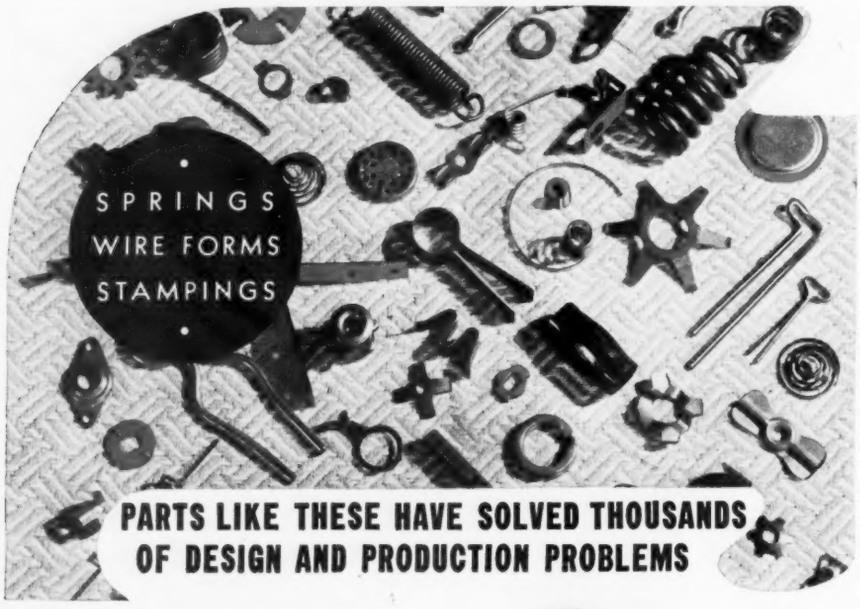
New York — Improvement noted in wire buying has been spotty, most producers reporting little change in demand, which is well diversified for prompt shipment. Finishing operations are up a few points at some eastern mills, partly the result of lower stocks of finished products at mills. Electrical goods drag with utility volume missing. The recent improvement in demand for merchant products in the north is about maintained.

Chicago — Sales of wire and wire products recently touched a peak for the year to date. While sales of merchant wire products have increased rather substantially the past two weeks, business is well below the volume a year ago when jobbers and retailers were active in building up stocks. Fairly heavy inventories at the opening of this year have restricted the accumulation of additional supplies though a fairly good outlook prevails for sales of barbed wire in rural districts.

Boston — Slight, but somewhat encouraging improvement in demand for wires, including specialties, entering into manufactured products of the consumer type, is noted by some mills. While the improvement has been small and spotty, sellers are hoping the trend represents a sustained upturn from the low levels of recent weeks. Both number and volume of orders have increased. Buying is still for prompt delivery with advance purchasing missing.

Rod mill operations are irregular, but slightly higher in a few instances with a mild increase in rod inquiries. Finishing operations are up a few points at some mills, but as a whole do not average better than 30 to 35 per cent.

Birmingham, Ala.—Wire products shipments continue fairly steady, with recent slight improvement. Mills expect a material upturn with augmented agricultural activity.



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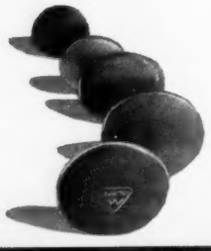
Every piece illustrated represents a design or production problem solved—many high involved. Hubbard has made thousands of parts like these in all kinds of shapes and materials.

Hubbard's long experience, skill, extensive facilities, and modern equipment, can work out the right part essential to your design or production scheme.

It will pay you to inquire.



Hubbard Expansion Plugs "The Original Welsh Plug"

M. D. HUBBARD, Pres. P. M. HUBBARD J. A. HUBBARD, Secy.

M. D. Hubbard Spring Company

613 CENTRAL AVE., PONTIAC, MICH.

Rails, Cars

Track Material Prices, Page 89

Current inquiry for cars is featured by two export lists. South African Railways & Harbors, Johannesburg, is inquiring for 500 to 1000 forty-ton drop-end gondolas and the Peruvian Corp. Ltd., London, is inquiring for 30 flatcars of 35-ton capacity.

Baltimore Transit Co. will open bids May 2 on 40 trolley cars. Milwaukee Electric Railway & Light Co. is in the market for 40 trolley coaches.

Missouri Pacific has placed 32,400 tons of rails and Central of New Jersey 2300 tons.

Domestic freight car awards in

March were 680 the best this year but comparing the total of 814 for first quarter with 30,933 in the corresponding period of last year and 9582 in first quarter 1936 it seems small. It is close to first quarter of 1935, when the total was 830.

	1938	1937	1936	1935
Jan.	25	17,806	2,050	24
Feb.	109	4,972	6,900	806
March	680	8,155	632	0
3 mos.	814	30,933	9,582	830
April		9,772	4,427	350
May		4,732	8,900	2
June		548	5,200	5,151
July		1,030	7,229	500
Aug.		1,475	225	200
Sept.		1,216	1,750	875
Oct.		1,355	2,210	1,250
Nov.		275	1,550	100
Dec.		275	23,450	10,050
Total		51,611	64,643	19,308

Rail Orders Placed

Central of New Jersey, 2300 tons, with substantial tonnage of fastenings, to Bethlehem Steel Co., Bethlehem, Pa.

Missouri Pacific, 32,400 tons, of which 22,000 tons are 112-pound and remainder 90 pound; dividend between Colorado Fuel & Iron Corp., Tennessee Coal, Iron & Railroad Co., Bethlehem Steel Co. and Inland Steel Co.

Car Orders Pending

Navy, delivery White Plains, Md., one 50-ton box car, Magor Car Co., New York, low; two 8000-gallon tank cars, American Car & Foundry Co., New York, low; three steel flat cars, Hyman-Michaels Co., Chicago, low; bids April 5, schedule 3113, navy bureau supplies and accounts, Washington.

Shapes

Structural Shape Prices, Page 88

New York—Structural contracts are led by 3600 tons for Manhattan bridge repairs, New York. Of this tonnage close to 1000 tons are plates. Two schools, New York, 860 tons will be closed this week with Bethlehem Fabricators Inc. and Dreier Iron Works, bids April 5 on the steel work direct. Bids are in on 4500 tons, new structural tonnage, another tunnel section, Delaware Aqueduct water project, Greenburgh, N. Y., making close to 15,000 tons pending for such work. Controversy over wage rates which brings costs well over the estimates, however, may delay placing of this volume indefinitely.

Pittsburgh—Construction projects are more numerous as spring construction gets underway. Although many projects involve small tonnages, several larger projects are pending. Awards include 5000 tons for the new Highland park bridge in Pittsburgh, to be fabricated by Bethlehem Steel Co., Bethlehem, Pa.

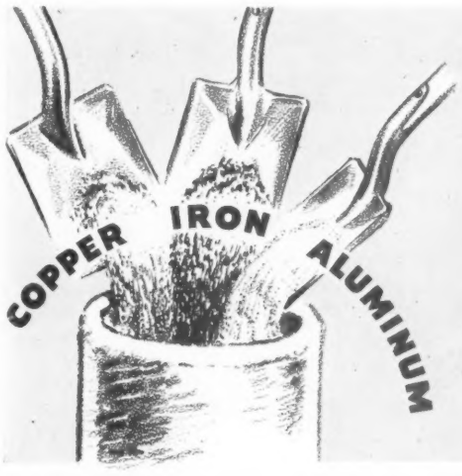
Cleveland — Structural inquiries and awards are little changed. While public work predominates the present outlook a small increase in private inquiries is noted. H. K. Ferguson Co., Cleveland, was awarded the general contract for the General Foods Co's. new plant at Hoboken, N. J., involving approximately 1000 tons. Prices remain firm.

Chicago — Fabricated structural awards and inquiries are less active than a month ago and practically all

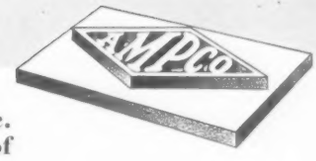
Shape Awards Compared

	Tons
Week ended April 9	**29,484**
Week ended April 2	**17,510**
Week ended March 26	**13,052**
This week, 1937	**48,585**
Weekly average, year, 1937	**16,060**
Weekly average, 1938	**15,468**
Weekly average, March	**16,309**
Total to date, 1937	**430,417**
Total to date, 1938	**232,013**

Includes awards of 100 tons or more.



JUST MELTING THEM TOGETHER WON'T MAKE "AMPCO METAL"



ONLY Ampco Metal, Inc. understands the method of combining copper, aluminum and iron to produce the "Ampco Phase" . . . the particular structural formation which provides Ampco Metal with those unmatched qualities which have led to its adoption by hundreds of nationally prominent manufacturers.

If you require a non-ferrous alloy that provides the utmost in wear resistance—tensile strength—corrosion resistance then insist on genuine Ampco Metal, distinguished by the diamond trade mark reproduced here. It is available only from this Company and its four licensee foundries . . . in six grades of varying hardness and physical properties. The book "Ampco Metal—Its Uses in Modern Industry" will interest you.

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Dept. S-4-11
Milwaukee, Wis.

AMPCO METAL
"The Metal without an Equal"

BEFORE YOU SPECIFY . . . INVESTIGATE AMPCO

new purchases are small. Most new inquiries are for bridges, with only moderate lots required for structures locally.

Philadelphia — Works Progress administration is reported to have agreed to contribute $20,000,000 in relief labor for construction of a $53,000,000 toll road from Harrisburg to Pittsburgh. The project involves a 106-mile road along abandoned roadbed of the projected South Penn railroad. The project will require approximately 50,000 tons of shapes and formed bars, it is roughly estimated.

Boston — Award of 2000 tons for a manufacturing building at Springfield, Mass., is outstanding. Tonnage is required for an expansion of Westinghouse Electric & Mfg. Co. facilities for the making of beverage coolers. Awards are generally few and in small lots, few being more than 100 tons. Shop backlogs are generally low, notably for bridges, although a 600-ton bridge closes in Rhode Island this week. Plain material is now 2.66c, Boston.

San Francisco—Structural market is most active one with 5070 tons recently booked, bringing the aggregate for the year to 29,510 tons, compared with 68,420 tons in 1937. Columbia Steel Co. secured 1550 tons, including 500 tons of H columns for the inter-state bridge between Washington and Idaho and 497 tons for shop buildings at Sacramento, Calif., for the Western Pacific Co.

Seattle — Operations at Seattle and Portland fabricating plants are below normal and will further curtail unless important projects develop soon.

Unit Steel Bids to Port of New York Authority

Approach, Lincoln tunnel, Paterson Plank road, North Bergen to Bergenline avenue, Union City, N. J.; tenders March 29, New York

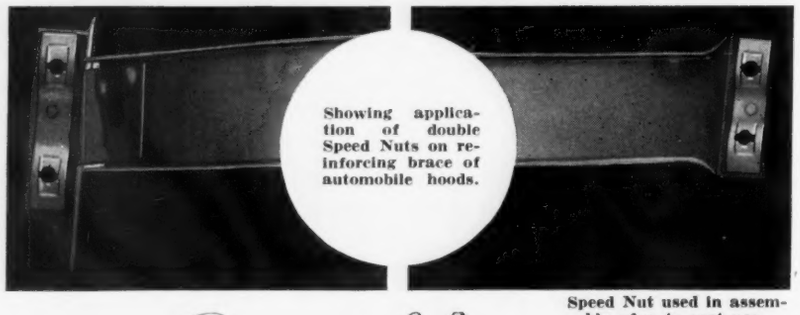
Material	Unit	A	B	C	D	Lowest Total
Reinforcing rods, lbs.	1,600,000	$0.07	$0.07	$0.05	$0.07	$80,000
Structural steel, lbs., delivered	1,500,000	0.055	0.055	0.045	0.06	67,500
Structural steel, in place, lbs.	1,500,000	0.015	0.01	0.01	0.02	15,000
Reinforcing trusses, lineal feet	29,500	0.45	0.47	0.46	0.45	13,275
Wire mesh, lbs.	19,000	0.10	0.10	0.22	0.10	1,900
Steel facing for curbs, lbs.	8,750	0.06	0.12	0.065	0.10	525
Metal railing complete, lineal feet	3,350	2.80	3.00	3.12	5.00	*6,700
Cast and forge steel, delivered, lbs.	17,000	0.14	0.15	0.17	0.10	1,700
Cast-forged steel, in place, lbs.	17,000	0.01	0.01	0.015	0.03	170
Steel conduit, duct, pipe, lbs.	46,000	0.39	0.70	0.40	0.40	*13,800

A—James Mitchell Inc., Jersey City, low and contract at $1,032,339; B—Poirier & McLane Corp., New York, second, $1,088,478; C—Woodcrest Construction Co. Inc., New York, third, $1,176,209.25; D—S. J. Groves & Sons Co., Ridgefield, N. J., fourth, $1,206,288.

*By fifth low bidder, P. J. Carlin Construction Co., New York.

SPEAKING OF SPEED

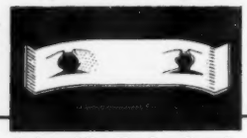
WE MEAN FASTER ASSEMBLY-LOWER COSTS



Showing application of double Speed Nuts on reinforcing brace of automobile hoods.

WITH Speed Nuts

Speed Nut used in assembly of auto seat pan.



Automobile Fender Speed Nut, below.

Emblem plate Speed Nut, below.

Yes, we mean speed geared to good common COST SENSE. With the SPEED NUT System of assembly, you eliminate conventional nuts and lock washers. You save all the time required in handling lock washers. That's better than an hour per thousand. Your bolt engaging means may be hooked or snapped in place over the bolt hole. As the bolt engages, it grips the assembly parts together under firm spring tension and remains forever tight, even under the most severe conditions of vibration. Let our development engineering department help you solve any assembly problem with a better finished assembly at lower cost.

SPEED NUT DIVISION

Tinnerman Stove & Range Co. ● 2039 Fulton Road, Cleveland, Ohio

Shape Contracts Placed

5000 tons, Highland park bridge, Pittsburgh, for Allegheny county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

3600 tons, Mellon museum of modern art, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; through Marc Eidlitz & Son Co., New York, general contractors.

3600 tons, including approximately 1000 tons of plates, Manhattan bridge repairs, New York, rebuilding main deck, to Harris Structural Steel Co., New York; bids March 31, department of public works, New York.

2514 tons, Pennsylvania state college buildings; McCloskey & Co., Philadelphia, low at $2,598,000, also includes 570 tons of formed bars.

1900 tons, manufacturing buildings, Westinghouse Electric & Mfg. Co., Springfield, Mass., to Bethlehem Steel Corp., Bethlehem, Pa.

1500 tons, Whitehill Industrial school, Harrisburg, Pa.; bids April 22.

960 tons, sheet piling, United States Engineer office, proposal 381, Los Angeles, to Inland Steel Co., Chicago.

810 tons, bridge, project FAP-2681, contract 2, Lincoln-McCormick counties, Georgia, to Nashville Bridge Co., Nashville, Tenn.

770 tons, quenching tower, coal bins and conveyor bridge, Ford Motor Co., Dearborn, Mich., to Whitehead & Kales Co., Detroit.

639 tons, sheet piling, bureau of reclamation, invitation 24,608-A-3, Blaisdell, Ariz., to Carnegie-Illinois Steel Corp., Chicago.

585 tons, building, General Realty & Utilities Corp., New York, to Bethlehem Steel Co., Bethlehem, Pa.

580 tons, high school, Rochester, N. H., to Lyons Iron Works, Inc., Manchester, N. H.

570 tons, armory, Seattle, Wash., to Isaacson Iron Works, Seattle, Wash.

540 tons, health center buildings, lower east side and Washington Heights, New York, to Harris Structural Steel Co., New York; through Caulway Inc., New York, general contractors.

497 tons, shops at Sacramento, Calif, for Western Pacific Railroad Co., to Columbus Steel Co., San Francisco.

450 tons, public school 15, Queens, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.; bids April 5, steel work direct, fabricating and erecting, board of education, New York.

410 tons, addition, public school 95, Brooklyn, N. Y., to Dreier Structural Steel Co., New York; bids April 5, steel work direct, fabricating and erecting, board of education, New York.

410 tons, high school, Salem, N. Y., to Utica Structural Steel Co., Utica, N. Y.

400 tons, highway project, Blue Ridge Parkway, Proj. 1T4, Stuart, Va., to Virginia Bridge Co., Roanoke, Va.

320 tons, bridge, FAP 200-D, Garvin county, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

250 tons, grade crossing, Pennsylvania railroad, West Seneca, N. Y., to Bethlehem Steel Co., Lackawanna, N. Y.

243 tons, three bridges, proposal 367, United States Engineer office, Los Angeles, to Bethlehem Steel Co., Los Angeles.
240 tons, central school, Fort Ann, N. Y., to Gray Structural Steel Co., Syracuse, N. Y.; through J A J Construction Co., New York.
235 tons, dormitory, Marymount college, Tarrytown, N. Y., to Levine Iron Works, Yonkers, N. Y.
225 tons, building, Borden Co., worlds fair, New York, to Bethlehem Steel Co., Bethlehem, Pa.; James Stewart & Co., general contractor.
210 tons, building, Coca Cola Co., Dallas, Tex., to Beaird Corp., Shreveport, La.
190 tons, foundry building, Bohn Aluminum & Brass Corp., Adrian, Mich., to Palmer Bee Co., Hamtramck, Mich.
170 tons, state highway bridge FAGH-SS-38-1, Cheektowaga, N. Y., to American Bridge Co., Pittsburgh.
168 tons, auxiliary buildings, Charity hospital, New Orleans, to Jones & Laughlin Steel Corp., Pittsburgh; R. P. Farnsworth & Co., New Orleans, general contractor.
150 tons, swimming pool and recreation building, Wellesley college, Wellesley, Mass., to New England Structural Co., Everett, Mass.
150 tons, including 500 tons H. columns, interstate bridge between Washington and Idaho, to Columbia Steel Co. San Francisco.
150 tons, building, Continental Baking Co., World's fair, New York, to Harris Structural Steel Co., New York; James Stewart & Co., New York, general contractor.
135 tons, bridge 1619, Gibson county, Indiana, to Vincennes Bridge Co., Vincennes, Ind.
131 tons, piling and shapes Washington state highway projects, to Bethlehem Steel Co., Seattle, and unstated interests.
120 tons, central school building, board of education, Romulus, N. Y., to F. L. Heughes & Co., Rochester, N. Y.
120 tons, storage building, City of Baltimore, Md., to Maryland Steel Products Co., Baltimore.
115 tons, bridge 14-45-FA 459-C, Jewell county, Indiana, to St. Joseph Structural Steel Co., St. Joseph, Mo.
112 tons, bridge, Somers Point, N. J., to Phoenix Bridge Co., Philadelphia.
110 tons, squash court, Harvard University, Cambridge, Mass., to New England Structural Co., Everett, Mass.
105 tons, bridge No. 1437, Kenosha, Wis., to Worden-Allen Co., Milwaukee.
100 tons, bridge repairs, Norwich-Sprague, Conn., to Berlin Construction Co., Berlin, Conn.; Medbury & Trowbridge, Putnam, Conn., contractor. Reported last week under reinforcing placed.

Shape Contracts Pending

18,000 tons, gate valves and structural steel for bridges, Shasta dam, 10 miles north of Redding, Calif., on the Sacramento river; bids due June 1, work also includes 13,000 tons of reinforcing bars and 6850 tons of penstocks.
4500 tons, structural supports, middle section, Kensico-Hill Ciew tunnel, Delaware Aqueduct water project, Greenburgh, N. Y.; J. A. Healey & Co., New York, low, contract 307, bids April 5, board of water supply, New York. Additional requirements include 105 tons, inner lining and risers; 115 tons, reinforcing and miscellaneous steel and 30,000 feet, 2½-inch steel pipe.
1800 tons, surgical building, Massachusetts General hospital, Boston, being refigured.
1250 tons, diversion tunnel and cofferdam, Lackawack dam, Wararsing, N. Y.; bids April 26, board of water supply, New York, contract No. 339, also including 500 tons of piling.
1000 tons, plant building, General Foods Co., Hoboken, N. J.; H. K. Ferguson Co., Cleveland, general contractor.
1000 tons, school 246, Brooklyn, N. Y.; bids April 12, steel works direct, fabrication and erecting, board of education, New York.
890 tons, 13 bridges, state of Wisconsin; bids April 19.
600 tons, stadium, Rice institute, Houston, Tex.
550 tons, state cancer hospital, Buffalo; bidding postponed until April 21.
500 tons, new building, Neisner Bros., Buffalo, Frank Messer & Sons Inc., Cincinnati, low.
460 tons, I-beam bridges, Winslow, Nebr.
400 tons, building, Gas Exhibits, Inc., world's fair, New York.
350 tons, addition to building, Y. M. C. A., Hartford, Conn.
300 tons, Lenox vocational school, board of education, District of Columbia.
300 tons, grandstand, DePere, Wis.
300 tons, TVA bridge, Gunthersville, Ala.
280 tons, bridge, Burt, Niagara county, New York; bids April 26.
280 tons, state hospital building No. 2, Buffalo.
278 tons, state underpass Missoula, Mont.; J. S. Bosepflug, Miles City, general contractor.
230 tons, settling basin, mixing chamber and tank, Trotter Water Co., Connellsville, Pa.
215 tons, crossing near Hewitt, Los Angeles county, California; Oscar Oberg, Los Angeles, low on general contract at $165,732.
200 tons, school, Greigsville, N. Y.; bids April 18.
170 tons, state bridge over Tygart river, Philippi, W. Va.
170 tons, building, U. S. treasury department, Kalamazoo, Mich.
140 tons, state bridge 304-C, Winslow Nebr.
125 tons, building addition, Mutual Life Insurance Co., Newark, N. J.
120 tons, state school for deaf, Malone, N. Y.
120 tons, bridge, Chenango county, New York; bids April 26.
Unstated, gates and conduit linings Coulee and Seminoe dams; low bidders Joshua Hendry Iron Works, Sunnyvale, Cal.; Valley Iron Works, Yakima, Wash; Lynchburg Foundry Co., Lynchburg, Va.; Consolidated Steel Corp., Los Angeles.

Reinforcing

Reinforcing Bar Prices, Page 89

New York—A mild flurry in small lot buying has been accompanied by a few large tonnage contracts, requirements already bid approximating 4000 tons, exclusive of 1600 tons of highway mesh, some of the latter being bought. Small lot buying for world's fair buildings is more active.

Pittsburgh — Orders for reinforcing bars are seasonally improved and tonnages compare favorably with last year. Several important projects are being offered. The out-

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look is favorable for continuation of present schedules.

Cleveland — Reinforcing bar sales in Northern Ohio from private sources on which estimates were requested totaled only 186 tons in March. However, this represents a substantial percentage gain over the 55 tons reported for February. Estimated tonnage of joists was 187 tons in March, against 121 tons in February. Awards are generally limited to miscellaneous tonnages well under 100 tons. Fabricated prices are weak, although no real test has recently been offered.

Chicago—While concrete bar distributors have moderate backlogs, new inquiries have been small and there is little prospect of an immediate upturn in bookings though a fair tonnage is pending. A number of small orders for state road work have been placed.

Boston — Closing bids April 18 at Hartford state highway work requires 480 tons, mostly mesh for two projects, Hamden and Norwalk, Conn. Since starting a belated program that state has taken bids or inquired for work requiring 1100 tons, most of which is still pending. Other states in this group lag. About 500 tons is pending for building construction, mostly public work. Small-lot buying has gained slightly. Billet steel reinforcing bars are now 2.87c, Boston.

Philadelphia—Some tonnage still remains to be placed in connection with state authority work, but no program of consequence other than Harrisburg - Pittsburgh all - weather highway remains ahead. Road work, usually expected at this time, is confined to a few small lots.

San Francisco—Most awards are composed of lots of 30 to 80 tons and the total for the week aggregated 1409 tons, bringing the year's total to 25,868 tons, compared with 20,932 tons last year. The largest award went to W. C. Hauck & Co. and called for 238 tons for a high school at El Cerrito, Calif. Bids will be called for June 1 for construction of the Shasta dam, 10 miles north of Redding, Calif., on the Sacramento river. The work involves 13,000 tons of bars, 6850 tons of penstocks and over 18,000 tons of gate valves and structural steel for bridges.

Seattle — Nothing has developed to improve the outlook. Tonnages pending are unimportant and new projects are lacking, in marked contrast to conditions a year ago.

Concrete Bars Compared

	Tons
Week ended April 9	**2,872**
Week ended April 2	**3,173**
Week ended March 26	**1,413**
This week, 1937	**4,727**
Weekly average, year, 1937	**6,266**
Weekly average, 1938	**4,825**
Weekly average, March	**3,893**
Total to date, 1937	**60,018**
Total to date, 1938	**72,370**

Includes awards of 100 tons or more.

Reinforcing Steel Awards

350 tons, additional buildings, veterans' hospital, Roanoke, Va., to West Virginia Rail Co., Huntington, W. Va.; A. Farnell Blair, Lake Charles, La. general contractor. Inter-State Foundry & Machine Co., Johnson City, Pa., awarded 75 tons of structural steel.

300 tons, grade separation, route 18, section 7VB2, Cicero, Ill., to Joseph T. Ryerson & Son, Chicago.

250 tons, highway work, Lakehurst, N. J., to Truscon Steel Co., Youngstown, O.; through Fred McDowell Co., Neptune, N. J.

238 tons, high school, El Cerrito, Calif., to W. C. Hauck & Co.

200 tons, high school, Muscatine, Iowa, to Joseph T. Ryerson & Son, Chicago.

185 tons, state highway project, Putnam pike to Rhode Island-Connecticut state line, Glocester, R. I., to American Steel & Wire Co., New York; Arute Bros., Inc., New Britain, Conn., general contractor.

175 tons, social science building, Springfield, Ill., to Laclede Steel Co., St. Louis.

171 tons, invitation A-24558-A, bureau of reclamation, Rutledge, Tex., to Southern States Steel Co., St. Louis.

169 tons, bureau of reclamation, invitation A-22,242-A, Parco, Wyo., to Sheffield Steel Co., Kansas City, Mo.

164 tons, auxiliary buildings, Charity hospital, New Orleans, to Connors Steel Co., Birmingham; R. P. Farnsworth & Co., New Orleans, general contractor.

160 tons, tax building, Honolulu, T. H., to unnamed interest.

105 tons, bridge, Canal street, New York, to Concrete Steel Co., New York; through James A. Stewart & Co., New York.

105 tons, Gila project, Blaisdell, Ariz., invitation 24616-A, bureau of reclamation, to Laclede Steel Co., St. Louis.

100 tons, police station, West Allis, Wis., to Joseph T. Ryerson & Son, Chicago.

100 tons, bars and shapes, store building, F. W. Woolworth Co., Danbury, Conn., to Topper & Griggs, Hartford, Conn., Fusco- Amatruda Co., New Haven, general contractor.

100 tons, building, Corn Products Refining Co., South Pekin, Ill., to Ceco Steel Products Corp., Chicago.

Reinforcing Steel Pending

13,000 tons, Shasta dam, 10 miles north of Redding, Calif., on the Sacramento river; bids due June 1, work also includes 6850 tons of penstocks and over 18,000 tons of gate valves and structural steel for bridges.

750 tons, filtration plant, St. Paul, Minn.

703 tons, vault for mint, San Francisco; B. A. Howkins, San Francisco, low on general contract.

425 tons, surgical building, Massachusetts General hospital, Boston; being refigured.

272 tons, crossing at Missoula, Mont.; J. C. Boespflug, Miles City, Mont., low on general contract at $226,531.

270 tons, mostly mesh, section of Merritt parkway, Norwalk, Conn.; bids

April 18, state highway commissioner, Hartford, Conn.

260 tons, 13 bridges, state of Wisconsin; bids April 19.

210 tons, mostly mesh, state highway project, Whitney avenue, Hamden and North Hamden, Conn.; bids April 18, state highway commissioner, Hartford, Conn.

201 tons, four bridges in Santa Barbara county, California; bids April 20.

200 tons, dam, spillway and tunnel, Arkport, N. Y.; bids April 15, U. S. engineer, Binghamton, N. Y.

110 tons, school, Wassaic, N. Y.; taking bids.

105 tons, building, Y. M. C. A., Hartford, Conn.

100 tons, storage reservoir, Bitteroot, Mont.

100 tons, storage reservoir, Nevada Creek, Mont.

100 tons, Catholic hospital, Anchorage, Alaska; bids in at Seattle.

100 tons, school, Anchorage, Alaska; bids in at Seattle.

100 tons, state cancer hospital, Buffalo; bidding potsponed until April 21.

100 tons, bridge, Santa Clara county, California; bids April 20.

Pig Iron

Pig Iron Prices, Page 90

New York — Due to new freight rate schedules, effective April 11, small increases of 3 cents a ton have been made on pig iron delivered Brooklyn, malleable now holding at $28 and No. 2 foundry at $27.50. No changes are being made in the northern New Jersey Metropolitan area.

Meanwhile, pig iron sales are light, with some of the larger consumers, who still have old stocks on hand, out of the market entirely and with the smaller companies, on an average, buying only for immediate needs which in most cases are far below normal. Some buying of low phos is noted for shipment abroad, relatively small orders however are believed in some cases to be placed for trial purposes.

Philadelphia—District interest is considering blowing out last remaining stack around May 1. Pig iron inventories have increased to well over 50,000 tons. Another interest, not operating, is taking some scrap which may indicate resumption. Pig iron buying continues on a hand-to-mouth basis. Based on coke shipments, foundry melt is holding at about the March level. Hardware trade currently is the most active.

Boston—Delivered pig iron prices to the more important consuming points in Connecticut range from 20 cents a ton higher, Hartford, New Haven and Bridgeport, to 23 cents, Waterbury, and 22 cents, New Britain, under the adjusted freight advances. Springfield, Mass., also is 22 cents a ton higher, but Worcester and Fitchburg, Mass., are unchanged. The rate to Taunton, Mass., however, is up 12 cents a ton. No. 2 foundry, delivered, Boston, from Birmingham is $25.87. Buying continues light in scattered small lots with few car lot releases appearing. Easier scrap prices do not appear to be cutting into pig iron sales much, as most melters are buying both iron and scrap only as needed.

Cleveland—Sellers report new business about on a par with the comparable period during March. Most foundries have cleared up former contracts, but many are not inclined to commit themselves for future requirements. Buying is limited to actual needs and for prompt delivery. Prices are unchanged.

Chicago — Little further improvement in pig iron shipments is looked for this month, April deliveries being expected to approximate those of March. Consumption shows little change, operations of most foundries holding around the low levels of the past several weeks. Schedules of producers of farm equipment castings are better than average, with a downward tendency noted among automotive plants. Higher freight rates on pig iron shipments east of Chicago become effective April 11.

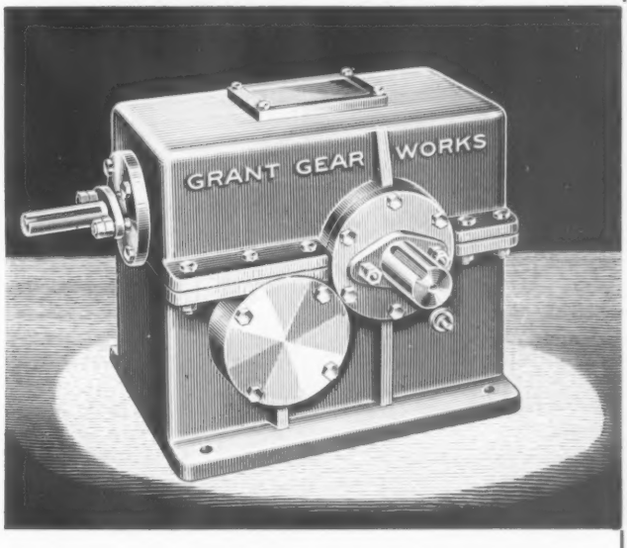
Buffalo—Although one stack was withdrawn last week, pig iron shipments improved slightly. While no forward buying is noted, better volume of orders is reported from nearby sections, while buying from local foundries continues slow. Nature of buying indicates consumer' inventories low with buying covering spot needs only. Tonawanda Iron Corp. was forced to take its furnace out of operation for relining. The furnace will be blown in as soon as possible.

Cincinnati — Heavier pig iron shipments last month, to avoid higher freight rates since in effect, are reacting on current tonnage which shows a diminishing trend. District melt is unimproved, and in some instances schedules recently reduced. New orders for more than immediate needs are infrequent. The dullness applies both to Northern and Southern iron markets.

St. Louis — Depleted pig iron stocks, particularly of smaller melters, are being replenished for immediate requirements. Numerous small orders, ranging from car lots to 250 tons, are being placed, many for rush shipment. Business is confined chiefly to malleable and foundry grades.

Final figures indicate the movement to consumers in March was measurably above February. In the

Grant Speed Reducers



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case of southern iron, the increase was approximately 50 per cent. While blast furnace backlogs have been considerably reduced, a fair tonnage of iron is still owed on 1937 contracts.

The only purchase of size was 2000 tons by a local melter for delivery over the next 60 days. Melt as a whole is increasing, but slowly. Farm implement interests continue to account for relatively large tonnages. Steel casting plant operations are at the lowest point in many months. Backlogs of railroad business have been heavily reduced.

Birmingham, Ala.—Pig iron production remains unchanged from its slight reduction of a month ago. Orders are sluggish.

Scrap

Scrap Prices, Page 92

Philadelphia—The scrap market shows further easiness. A mill in this district bought several thousand tons of No. 1 steel about April 1 at $14.50 and subsequently has covered further tonnage at $14, with this quotation now representing the top of the market. Contrary to reports No. 1 steel is not available at less than $14. No. 2 steel is at a maximum of $12, with one important consumer dropping its offering price to $11.50. Other grades have participated in the easier market, including specialties and some cast grades. Old compressed sheets are moving to one plant on the basis of $9.50. The generally softer situation reflects refusal of shipments by one large consumer and the drop in export buying. Minimum prices paid recently for export are $14 for No. 1 and $13 for No. 2, despite reports that business has been done at $1 less. A consumer at Pencoyd, Pa., is offering 17,000 tons of scrap, including 7000 tons of No. 2, 5000 tons of compressed sheets, 4000 tons of No. 1 and 1000 tons of heavy breakable cast. According to the scrap trade this plant will no longer be operated.

The following tonnages of scrap are revealed to have been exported from Philadelphia in February: 3679 tons to Germany at an average price of $18.55 per ton; 7267 tons to Italy at $13.89; 28 tons to Poland at $40; 12,531 tons to Great Britain at $18.36 and 2796 tons to Japan at $17.92.

Pittsburgh—Practically the entire scrap list has been revised downward here as a result of several factors. Predominant among these is the drop in export prices, which have acted as an artificial prop in this district. The fact that mills have been out of the market for some time added its share to the current weakness. No. 1 steel is now quoted $12.50 to $13 and has been offered to mills at less than $13, although only small quantities are available. Recent sales of No. 2 steel show the range is between $11.50 to $12, although weak at that figure.

Cleveland—Several grades of iron and steel scrap are being shipped to the Youngstown district but tonnages are not large. One melter there has just bought some No. 1 heavy steel around $12, about $1.35 below the last published minimum. Pressed sheets also have been sold in the valley around a minimum of $11, or $1 lower than the last published minimum.

Chicago — Scrap remains quiet. Only small shipments remain to be made against old mill orders and there are prospects for only limited new business. Prices are easy and nominal figures prevail on consumers' quotations. Offerings are restricted by the limited market available.

Boston — Iron and steel scrap prices tend to sag. For export No. 1 heavy melting steel brings $12.50, dock, for most tonnage, about 10,000 tons being scheduled for loading in two boats within the last week. Much of the heavy melting steel now being shipped is No. 2, for which dealers are paying $11.50 to $12, dock. Yard dealers are not pressing for material which requires much preparation and domestic buying continues listless.

New York — Domestic demand for scrap being practically at a standstill, prices on several grades have weakened. Quotations on steelmaking grades are mostly nominal. The export outlook is dimmed by holding up of shipments by England and shippers have difficulty in getting other foreign consumers to take scrap shipments owed them. There are no indications of additional early purchases by the cartel.

Buffalo—Further weakness developed in the iron and steel scrap market as a general price reduction of 50 cents a ton failed to uncover new demand. The chief consumer withdrew a bid of $12.50 a ton for No. 1 heavy melting steel, due to the heavy offerings.

Cincinnati — Prices of iron and steel scrap have receded as an effect of the general market weakness. Lacking a consumer market, dealers shun further accessions and prices reflect this attitude. Tempting of consumers with lower prices is found futile in face of desire to reduce inventories. Heavy melting steel is quotable 50 cents lower at $8.50 to $9.

Detroit—Little material has appeared this week, but prices aver-

age about 50 cents per ton lower in nearly all grades of iron and steel scrap.

In many cases dealers quoting prices considered far below the market find themselves buyers. Yard stocks are becoming increasingly heavy, and the economic pressure on small dealers is severe. Some casualties in the ranks of the latter already have appeared.

St. Louis — Iron and steel scrap prices continue to sag under lack of consumer interest and more liberal railroad offerings. Consumer stocks have declined perceptibly, due, however, more to the long period of no buying rather than broadening of consumption. Yard stocks remain about stationary. Dealers' contracts have also dwindled to small size, and interchanges among them are becoming scarce. New business in the past week or ten days has been confined to small lots of special material for prompt shipment.

Birmingham, Ala.—Scrap demand is limited. What scattered lots are being sold are of No. 1 cast.

Seattle—A cargo of about 12,000 tons of scrap was dispatched to Japan this week by Dulien Steel Products Inc., Seattle, the vessel loading at Northwest ports. New business is lacking, however, as Japan is out of the market until third quarter.

Warehouse

Warehouse Prices, Page 91

Philadelphia — Jobbers have revised the quantity setup on hot-rolled commodities, including bars, strip, shapes, plates and No. 8 to 16 gage hot-rolled annealed sheets. Five hundred to 1999 pounds take base price, 2000-9999 pounds less 20 cents, 10,000-39,999 pounds less 30 cents, 40,000 pounds and over less 40 cents, 100-499 pounds plus 50 cents and under 100 pounds plus $1. Orders between 500 and 999 pounds, which previously carried a 25 cent extra, now are free of this charge but orders for 99 pounds or less carry a heavier charge. The combined total weight of items listed above and released for shipment at one time govern the prices applying. Other hot-rolled items such as reinforcing bars and No. 24 hot-rolled annealed sheets are not included. Base quotations on most products now reflect the increase in the less-carload rate from Pittsburgh to Philadelphia of 3 cents per 100 pounds.

Cleveland — Warehouse distributors note little improvement in average daily shipments. Incoming orders are in about the same volume as during the first two weeks of March. The increase of 3 cents per 100 pounds on steel products which are on a Pittsburgh base, resulting from the increased freight rate on interstate shipments on less than carload shipments, has had little effect on sales from jobbers stocks.

Chicago — Sales are fairly well sustained though the slightly downward tendency common to April business is looked for during the balance of the month. Higher prices on cold-rolled strip and tubes result from recent freight rate increase.

Boston—Jobbers have advanced warehouse prices three to six cents per 100 pounds under the higher freight schedules, cold-rolled strip being 3.86c, Boston. No. 24 galvanized sheets in 50 bundle orders are 4.91c and cold-finished rounds, flats, squares and hexagons 4.71c. Numerous items included in the 10,000-pound quantity differential plan are up six cents per 100 pounds. Orders, while small, are more numerous. In this district March volume was considerably above the previous month, but only slightly better than January.

Cincinnati — Price increases in warehouse items, due wholly to freight rate changes, have apparently brought no market effect. Volume is virtually unchanged from the March levels and dependent on subnormal industrial needs. A seasonal lift from building requirements has not appeared.

New York—Steel warehouse sales are improving slowly, and, while some items reflect demand for routine repairs and miscellaneous outdoor work, lack of new building and industrial demand is depressing.

Buffalo—Warehouse business is marking time around the level of the two previous months. Cold-finished bars, alloy steels and specialties are moving at a slightly better rate than hot-rolled lines.

Detroit—Sales of warehouse iron and steel products are about on a par with March, which showed some improvement over February. However, activity is well below the rate of last year.

St. Louis — Warehousemen report March sales best since last November, despite the tapering off noted during the last two weeks. Decline as compared with first half of the month was ascribed to unseasonably cold weather and torrential rains. So far this month trade has been spotty, but on the whole about maintaining the March daily average.

Seattle — Volume is slightly improved, sales being in small tonnages. Business is far below 1937

levels. Labor difficulties in the salmon canning industry are retarding sales, while lumber and logging firms are curtailing production due to poor business. Governmental departments are placing seasonal requirements, small lots as a rule. Prices are firm.

Iron Ore

Iron Ore Prices, Page 92

New York — Chinese wolframite has again declined, now holding at $21 to $22 per short ton unit, duty paid. This reflects the easier market in Europe and is a purely nominal spread here, inasmuch as little or no ore is being bought in this country.

Cleveland—Opening of the iron ore season on the Great Lakes still is a few weeks off, due to heavy ice in Whitefish Bay and Lake Superior. Inland Steel Co.'s freighter PHILIP D. BLOCK was stopped by ice last week and returned to Toledo, O., for a cargo of coal. Last year navigation opened April 13.

Prices have not been determined, no inquiries having appeared.

Steel in Europe

Foreign Steel Prices, Page 91

London—(*By Cable*)—Demand for pig iron in Great Britain is slow and some stocks are being accumulated, partly due to recent importations on last year's contracts. Pig iron exports are lifeless. A probable Anglo-Italian agreement stimulates hope of a revival of Italian buying of steel and iron materials. Some signs are appearing of a revival in steel activity. The automobile industry continues at a slow pace and the sheet market is apathetic.

The Continent reports an increase of inquiries for export. The steel entente has reduced prices on merchant steel bars slightly for Holland and Sweden.

Cold-Finished

Cold Finished Prices, Page 89

Pittsburgh — Orders for cold-finished steel products began a downward trend in the closing days of March and have slumped considerably in the past week. Although March orders showed a decided increase over February, the total tonnage was small, largely because of lack of automotive orders. Prices are firm.

Ferroalloys

Ferroalloy Prices, Page 90

New York — Reflecting the leveling off in steelmaking operations, ferromanganese shipments are moving more slowly. Sellers are still inclined to believe the movement for this month will be heavier than last, but, nevertheless, are less certain than they were a fortnight ago. While the base price is unchanged at $102.50, Atlantic and Gulf ports, delivered price at Pittsburgh has been advanced to $107.77, effective April 11, by virtue of the increase in freight rates. The former price was $107.49.

Domestic spiegeleisen, 19 to 21 per cent, is $33, Palmerton, Pa., and 26 to 28 per cent, $39. Shipments are moving less actively than a week ago, in line with reduced steelmaking operations.

Semifinished

Semifinished Prices, Page 89

Semifinished production has dropped sharply, reflecting sudden slump in orders from both producers and nonintegrated mills. Effect of this drop-off has shown itself in curtailed ingot production schedules. Both skelp and sheet bars are below last month's levels. Condition has been aggravated by the fact orders have been on a hand-to-mouth basis.

Nonferrous Metals

Nonferrous Metal Prices, Page 90

New York—Developments generally outside the markets themselves continued to be the determining price factors in metals last week. The exception was a $5 per ton decline in domestic zinc which was made in an attempt to balance demand more closely with supply. Fluctuations in prices on the London Metal Exchange followed the trend in security markets and general business sentiment.

Copper — Prices on the London Metal Exchange declined from the highs established on Monday but at the close were above levels prevailing at the end of the previous week. Export copper closed around 9.70c compared with 9.50c at the close of the preceding week. Demand here continued quiet with all first hands quoting electrolytic unchanged at 10.00c, Connecticut.

Lead—Daily business was confined to routine carlot bookings. Prices held at 4.50c, New York, and 4.35c, East St. Louis.

Zinc — Stocks increased further during March but the rise was checked somewhat by the heavier shipments which in turn may have been stimulated by the rise in freight rates early this month. Sellers lowered prices 10 points on Monday and 15 points further on Friday to the basis of 14.00c, East St. Louis. Sales failed to improve.

Tin—Heavy speculative selling in London drove prices sharply lower early in the week, reaching a low of £167 15s on Thursday. Due to the strength in Wall street and improvement in sentiment here on Friday, prices recovered to £171 by the week-end. Buyers in the domestic market placed only a small volume of business at the lower levels.

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THE McKAY COMPANY
McKAY BUILDING, PITTSBURGH, PA.

Activities of Steel Users, Makers

(*Concluded from Page* 33)

States Cast Iron Pipe Co., Provo, Utah.

♦

American Chamber of Commerce has moved from the Aldwych House, London, W. C. 2, to the Bush House, London, W. C. 2.

♦

International Nickel Co. is installing in its research laboratories at Bayonne, N. J., an interchangeable-shell type, size "T" Lectromelt furnace.

♦

Guardian Utilities Co., manufacturer of couplings, will move April 15 from 1023 East Forty-sixth street, Chicago, to 215 East Michigan avenue, Michigan City, Ind.

♦

Thiokol Corp., manufacturer of oil-proof synthetic rubber, Yardville, N. J., has moved its general offices and laboratory to 870 North Clinton avenue, Trenton, N. J.

♦

Welding Engineering Co., Milwaukee, has moved from 2872 North Forty-first street to larger quarters at 264 East Ogden avenue, rounding out about 20 years in the welding field.

♦

Ingalls Iron Works Co. and its subsidiary, Steel Construction Co., Birmingham, Ala., have moved their Pacific coast offices to larger quarters in the Russ building, San Francisco, to handle increased business.

♦

Eastern Rolling Mill Co., Baltimore, has opened a new district sales office in Winston-Salem, N. C. C. Allen Hurt is in charge, with headquarters in the Reynolds building.

♦

Marley Co., formerly located at 1915 Walnut street, Kansas City, Mo., is now occupying its new warehouse and office building at 3001 Fairfax road, Kansas City, Kans.

♦

Republic Steel Corp., Cleveland, has moved its Buffalo district sales office, under the management of C. A. Cherry, from Liberty Bank building to new quarters in the Rand building.

♦

Northern Engineering Works, Detroit, maker of cranes, hoists and special machinery, has appointed Busch-Lawrence Inc., Cincinnati, as sales representative in Cincinnati, Dayton, Columbus and surrounding territory.

♦

Stearns Magnetic Mfg. Co., Milwaukee, formerly Magnetic Mfg. Co., recently shipped a special laboratory model of its type "K" gravity induction magnetic separator to a European educational institution serving the mining industry.

♦

Ferracute Machine Co., Bridgeton, N. J., manufacturer of forming presses and dies, has appointed Bryant Machinery & Engineering Co., Chicago, as its exclusive dealer in the Chicago territory for its entire line of machinery.

♦

Graham-Paige Motors Corp., Detroit, has announced a new plan under which Graham dealers and certain other dealers with automotive franchiscs will be offered the Graham-Bradley tractor and Bradley farm tools for sale except in the immediate trading areas of Sears Roebuck & Co. retail stores.

♦

Hammond Machinery Builders Inc., Kalamazoo, Mich., has appointed Arthur E. Smith, 320 Jackson building, Buffalo, as its representative in western and central New York, and William C. Edgar, Oliver building, Pittsburgh, representative in western Pennsylvania and northern West Virginia, handling the sale of grinders for foundry use.

♦

Labour Co., Elkhart, Ind., is installing a small triplex type Lectromelt furnace of the top charge type. Construction of the unit will permit the use of three different shells, which are of the size "U" type to operate with heats of about 500 pounds each.

♦

Roots-Connersville Blower Corp., Connersville, Ind., has appointed the following representatives to handle sales of its turbine pumps in the mid-western section: Herman L. Krouse, Fort Wayne, Ind., will cover the northern two-thirds of Indiana, and A. K. Howell Co., St. Louis, will promote the sale of turbine pumps in the eastern half of Missouri and about a dozen contiguous counties across the river in Illinois.

Plan To Use Basic Pig Iron Slag on Large Scale

■ Celotex Corp., 919 North Michigan avenue, Chicago, under license by the Pottsco Corp., Chicago, has acquired full rights to manufacture, and sell Pottsco lightweight concrete aggregate. The plan is to introduce on a major scale a material finding increasing acceptance by architects and engineers for lightweight construction, combining structural strength, heat and corrosion resistance.

Pottsco aggregate is made under a patented process from molten basic pig iron slag. Treatment of the molten slag, chemically neutral and inert, with a controlled volume of water at controlled temperature produces a vitreous clinker of porous cellular structure. This is crushed and screened to desired size. The material is said to be approximately twice as resistant to heat as ordinary aggregates.

Potential supply of basic pig iron slag "is practically as inexhaustible as the national reserves of iron ore, coal and limestone," says the company.

Japan in Lead As Scrap Buyer

New York — Japan recently has been the most important buyer of scrap in the United States, it is revealed by figures for February, the latest month for which statistics are available. Reports were current some weeks ago to the effect that Japan was buying about 100,000 to 140,000 tons of material. This apparently is verified by the February figures which show that country took 88,103 tons compared with 31,281 tons in January and approximately 9000 tons in December.

Considerable scrap also moved to Japan in March, according to private reports and the movement will be fairly substantial this month. The Japanese find it more profitable to buy in small lots and these purchases have rimmed the entire coast of the United States and even Hawaii. Prices reflect the easing in the scrap markets. As an example, Japan took 14,067 tons out of New York in January at an average of $15.57 but in February acquired 26,908 tons at $15.36.

A feature of February statistics was entrance of Germany into the picture. Previous lack of German buying was attributed to transshipment of material through Belgium, Holland and Poland. These reports subsequently have been denied.

Winding up most shipments against tonnage bought by the scrap cartel a few months ago already began to show in the February statistics. Belgium took 10,115 tons in January but practically none in February. February shipments to Poland dropped to 15,262 tons from 59,476 tons in January, Holland to 24,169 tons from 58,232, and Great Britain to 78,802 tons from 128,108. Britain recently has been holding up shipments.

Indications are the scrap cartel will make no important purchases in the United States in the next few months. Italy has been picking up some material recently but is less interested as shown by the February total of 17,107 tons, compared with 47,617 tons in March. Lack of interest is reported due to easing of pressure for finished steel and to purchase of 350,000 tons of scrap in France.

According to reports, scrap supplies have been fairly well cleaned up in a broad strip along the entire coastline. In some areas, especially in Eastern Pennsylvania, it is felt that scrap prices will advance sharply when steelmaking activity resumes. In others, however, such as metropolitan New York and New England, no drastic shortage is apparent.

Reader Comments

(*Concluded from Page* 17)

tween the foreign value of our imports and the domestic value of our exports, means that imports represent the displacement of a greater volume of domestic goods than is represented by the goods exported. To the extent that this is a factor of importance, its effect is enhanced by an increase in the total of our foreign trade despite the fact that the trade may still remain in "balance."

Foreign trade of every nation has risen since the world depression struck bottom. There is no proof that reciprocal trade agreements are a dominant factor in the rise. With the return of better times, it is only natural that we buy more of everything, including the products of foreign nations. Similarly, now that we are again in the throes of depression, our purchases of foreign commodities have slumped badly in recent months.

EASTERN MERCHANT
PIG IRON PRODUCER

Equipment

Chicago—Caution still marks buying of most types of machinery and plant equipment. Few large lists are pending and while inquiries are fair, in a number of instances these are primarily for price determination purposes, and closing awaits the appearance of more favorable business developments. Railroads are counted on for little buying this year though occasional purchases are expected to result from sheer necessity. Some tools still are pending on recent lists of the Santa Fe and Milwaukee railroads. Foundry equipment buying still lags while small tool demand continues slow despite some improvement during the past 60 days.

New York — Machine tool orders, mostly for one or two units at a time, are accompanied by a decline in inquiries for estimates on prospective requirements. Until recently estimating has held up surprisingly well. Now much of this prospective volume has been figured and is held up until the general industrial atmosphere clears. Some builders, notably in the Mid-west, have built up moderate stocks of various units for prompt shipment and deliveries on most near-standard lines are about normal with domestic backlogs smaller.

Some radical changes are reported probable in 1939 automobile models, but are likely to be reflected in dies to a greater extent than re-tooling. New foreign orders continue in reduced, but fair volume.

Seattle — Considerable business is pending at Coulee dam where Consolidated Builders Inc. will begin operations soon. H. G. Purcell, Seattle, has sold a 30-ton Brownhoist crane for the project. Fish cannery machinery is inactive due to stalemated negotiations with the unions.

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Construction and Enterprise

Illinois

CHICAGO — Central States Iron & Steel Co., 130 North Wells street, has been incorporated to trade in scrap iron and metals. E. Glist, B. Padnos, H. Bloch, incorporators. Barney Padnos, 188 West Randolph street, correspondent.

GRIGGSVILLE, ILL.—City, J. Logsdon, mayor, has completed preliminary plans for sewage disposal plant, complete with auxiliary piping, accessories and appurtenances. Cost $85,000. Bond election to be held soon. City is seeking WPA funds. Russell & Axon, 4903 Delmar boulevard, St. Louis, engineers.

HARDIN, ILL.—City has preliminary plans for sewage disposal plant, complete with auxiliary equipment, piping and appurtenances. Cost $45,000. City will seek WPA funds. Russell & Axon, 4903 Delmar boulevard, St. Louis, engineers.

MARINE, ILL.—City is making plans for waterworks improvements, including reservoir, filter plant, distribution mains and hydrants. Cost $50,000. E. A. Fulton, 3 South Meramec street, Clayton, Mo., engineer.

MATTOON, ILL.—Illinois sanitary water board has ordered city to construct sewage treatment plant.

OBLONG, ILL.—City, care of M. Cortelyou, mayor, has completed preliminary plans for sewage disposal plant complete with auxiliary equipment, piping, appurtenances and accessories. Cost $30,000. Will apply for WPA funds. Russell & Axon, 4903 Delmar boulevard, St. Louis, engineers.

WORDEN, ILL.—City has preliminary plans for waterworks and distribution system. Is seeking WPA funds. Cost $30,000. Russell & Axon, 4903 Delmar boulevard, St. Louis, engineers.

Ohio

CEDARVILLE, O.—Village plans sewage disposal plant and extensions in present sewer system. Cost about $30,000. Probably will petition for WPA funds. Engineer not yet appointed.

CLEVELAND—Eaton Mfg. Co., formerly manufacturers of automobile bumpers, will rehabilitate its plant at Central avenue and East Sixty-fifth street for assembly of hot water automobile heaters. Cost $100,000. George S. Rider Co., architect. Sam W. Emerson Co., 1836 Euclid avenue, general contractor.

HAMILTON, O.—Butler county plans laying out, constructing, establishing and maintaining sewage system and sewage disposal plant in Mayfield sewer district. Cost $46,000. F. M. Hammerle, Hamilton, county engineer.

TOLEDO, O.—City plans improving filtration plant, Broadway pumping station and water distribution system. Cost $2,459,411. J. N. Edy, city manager, in charge.

Michigan

DETROIT—Carboloy Co. Inc., 2985 East Jefferson street, plans one-story manufacturing, laboratory and office building. Cost $500,000. Smith, Hinchman & Grylls, 800 Marquette building, architects.

GRAND RAPIDS, MICH.—Plans for a factory building to be erected here for American Seating Co. have been completed by Osgood & Osgood, Grand Rapids, architects.

JACKSON, MICH.—Eaton Milne Electric Co. will erect new plant here. Mott & Horner, Jackson, general contractor.

MENOMINEE, MICH. — City plans erecting municipal light and electric plant. Cost $830,000. WPA pledged $504,730 for water softening plant at Flint, Mich., including extension to water and sewage disposal systems.

MIDLAND, MICH. — Town plans improvements to waterworks system. Cost $50,000.

MILFORD, MICH.—Shreve, Anderson & Walker, Detroit, architects, have been selected to prepare plans for a power plant to be erected at Milford for Ford Motor Co. Plans include dam, powerhouse and equipment.

NORTH MUSKEGON, MICH.—North Muskegon city council has ordered Alfred E. Hansen, city engineer, to ask state department of health for permit to build and operate sewage disposal plant to be financed by WPA funds. Cost $45,000.

Connecticut

NEW HAVEN, CONN.—United Illuminating Co., 128 Temple street, A. W. Kraft, president, plans extensions to power generating facilities at English power station. Cost $150,000. Private plans.

Massachusetts

EAST SPRINGFIELD, MASS.—Westinghouse Electric & Mfg. Co., Union Bank building, Pittsburgh, Pa., and 647 Page boulevard, East Springfield, Mass., plans being completed by Prack & Prack, Martin building, Pittsburgh, soon takes bids on two-story manufacturing plant. Cost $1,250,000. L. E. Osborne, manager, East Springfield plant.

New York

ILION, N. Y.—Village plans water treatment plant. Application for WPA grant already approved in Washington, and awaits final approval from WPA in Albany, N. Y. Cost $33,863. Engineer, care of owner, engineer.

LOCKPORT, N. Y.—City had surveys made by Shoecraft, Drury & MacNamee, Ann Arbor, Mich., engineers, for sewage disposal plant and intercepting sewers. Cost $1,500,000. A. G. Ward, city engineer. Owner's son selects consulting engineer.

NEW YORK—Horton Pilsner Brewing Co., 460 West 128th street, plans power plant and brewery improvements. Cost $75,000.

New Jersey

RAMSEY, N. J.—Borough plans sewage disposal plant and sanitary sewers. Cost $290,000. J. A. Conklin, De Baume avenue, engineer.

Pennsylvania

WELLSBORO, PA.—Wellsboro Electric Co., G. H. Hill, manager, plans expanding electric light and power plant and distribution system, as well as enlarging generating plant and installing new equipment. Cost $150,000. Maturity soon.

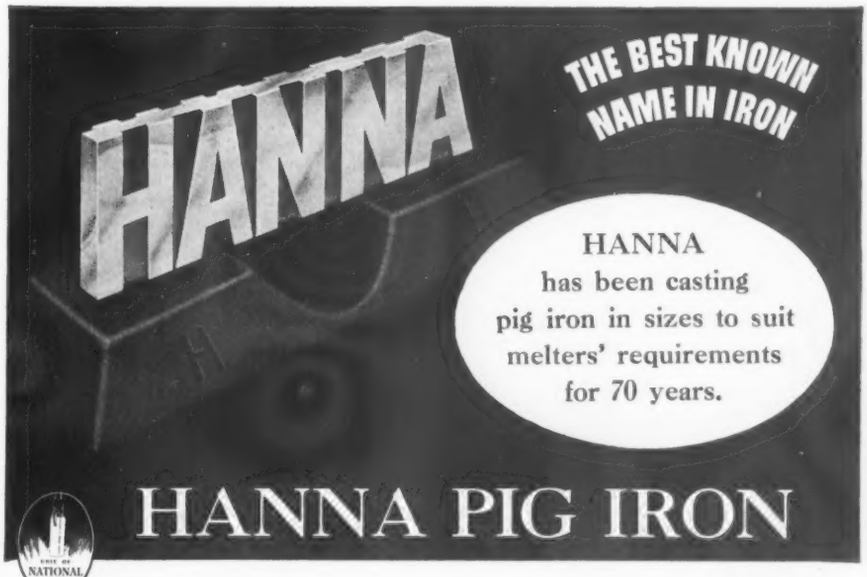
Indiana

ELKHART, IND.—Craftsman Equipment Corp., Elkhart, has been incorporated to manufacture machinery and tools. Corporation has 200 shares no par value capital stock. Verne G. Cawley, Flora F. Ringer, Donelda Stritz, incorporators.

EVANSVILLE, IND.—Board of school trustees, Seventh and Vine streets, takes bids soon for one-story boiler plant in connection with new vocational school at Wedeking avenue and Stringtown road. Cost of entire project $250,000. Fowler & Legeman, Central Union Bank building, Evansville, architects.

HUNTINGTON, IND.—Board of school trustees, H. A. Buzzard, secretary, is considering constructing new steam powerhouse at central school for central heating service. Cost $50,000 with boilers and equipment. Financing being arranged.

KOUTS, IND.—Town board plans deep well distribution system, elevated steel tank, and pumping equipment. Cost



THE HANNA FURNACE CORPORATION
MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION
Buffalo Detroit New York Philadelphia Boston

$65,000. Suhr, Berryman, Peterson & Suhr, 130 North Wells street, Chicago, consulting engineers.

RICHMOND, IND. — Johns-Manville Corp., 22 East Fortieth street, New York., plans installing electric power equipment in one-story addition to fiber conduit plant at Richmond. Cost $70,000.

Maryland

BALTIMORE—Moehle & Associates, 217 West Franklin street, architects, have plans in progress for power plant.

BALTIMORE—Board of awards receives bids April 6 for blower house etc. at Black river sewage disposal plant.

BALTIMORE—Board of awards receives bids April 6 for contract 322, electrical work at Black river sewage disposal plant, and contract 329, for blowers.

BALTIMORE — Board of awards receives bids April 6 for furnishing and installing electrical equipment in blower house at site of Back river sewage treatment works. Includes switches, transformers, motor starters, disconnecting switches, battery, switchboards, conduit wire and other equipment.

District of Columbia

WASHINGTON — Bureau of supplies and accounts, navy department, takes bids to 10 a.m., April 15, schedule 3189, for high tensile steel plates, delivery Washington; schedule 3212, for universal motor-driven milling machines with spare parts, tools and equipment, delivery Brooklyn, N. Y., and Philadelphia; schedule 3230, for end mill high-speed steel cutters, delivery Washington; until 10 a.m., April 19, schedule 3154, for iron pipe fittings, delivery various east and west coast points; schedule 3239, for steel expansion rings, delivery Brooklyn, N. Y.; until 10 a.m., April 22, schedule 3223, for steel plates, delivery Mare Island, Calif.; schedule 3222, for bearing circle rings, delivery Washington.

WASHINGTON — General purchasing officer, Panama canal zone, takes bids to 10 a. m., April 18, schedule 3345, for electrical laboratory equipment, including motor generator set, rotary machines, switchboard and transformers; heavy-duty lathe; power mowing machine; tractor mowers; iron or steel sheets; steel bars; spring steel; rail splice bars; wire rope; and soft steel wire, delivery Cristobal or Balboa, Isthmus of Panama, Canal zone.

Louisiana

SUNSET, LA. — City, J. W. Clay, mayor, receives bids April 19 for furnishing labor and material and constructing complete system of natural gas transmission and distribution. Includes general contract, pipe, cocks, valves, meters, regulators. F. P. Joseph, Glenmore, La., consulting engineer.

Virginia

RICHMOND, VA.—Virginia Electric & Power Co. is arranging $650,000 appropriation for extensions and improvements to power plant and transmission system during 1938, including installing additional equipment.

WINCHESTER, VA. — City, Percy D. Miller, mayor, votes in April on bonds for water improvements.

Missouri

MT. VERNON, MO.—Ozark Co-operative Electric Co., Arley Brown, president, receives bids April 14 for rural electric distribution system, consisting of 130 miles in Lawrence, Green, Polk and Dade counties. Sverdrup & Parcel, Railway Exchange building, St. Louis, engineers.

ST. LOUIS—Square Star Can Co., 211 Lucas avenue, has been incorporated here with an authorized capital of $50,000 to manufacture tin cans and other metal containers. William J. Geist, president.

ST. LOUIS—Anheuser-Busch Inc., 721 Pestalozzi street, has filed plans for extensions and improvements to powerhouse at brewery. Estimated cost with equipment $70,000.

Oklahoma

JAY, OKLA.—H. E. Walter, 1309 East Tenth street, Oklahoma City, plans waterworks system. Cost $30,000. Franchise already voted. Private plans. (Noted in STEEL, Dec. 27, 1937.)

PONCA CITY, OKLA. — Continental Oil Co., Ponca City, has plans for constructing casing-head gasoline plant in K. M. A. field of Wichita county, Texas. Site to be selected at once. Will be designed for initial capacity of 15,000,000 cubic feet of gas daily, and later will be enlarged. Includes large diameter gathering lines so as to bring gas to the plant from greater distances.

Minnesota

COSMOS, MINN.—City, F. H. Zrust, clerk, is taking bids to 7:30 p. m., April 21, on item B, constructing new steel tower and 30,000-gallon wood tank; item E, furnish and install one deepwell turbine pump with capacity of 100 gallons per minute, including water level control and pressure and drawdown gages. Plans obtainable from Early G. Briggs, 1957 University avenue, St. Paul, consulting engineer. (Noted in STEEL, Jan. 24, 1938.)

EXCELSIOR, MINN. — City, M. M. Leach, recorder, is taking bids to 10 a.m., April 23, for constructing sewage treatment plant and uptown lift station completely installed as per specifications on file with consulting engineer. Druar & Milnowski, 830 Globe building, St. Paul, consulting engineers.

ROCHESTER, MINN.—Tri-State Telephone & Telegram Co., O. A. Beliveau, local manager, has just begun work and will purchase equipment for additional central office switching equipment, construct new power plant, storage batteries, aerial cable, terminals to serve as underground cable outlets.

ST. PAUL — City, H. W. Austin, city purchasing agent, is taking bids to 2 p.m., April 12, for unit 3, constructing extension to filter building, flocculator building, two clarifiers with dome roofs; unit 4, pipe work, cast-iron pipe, rate controllers, gages, and Venturi meter; unit 5, heating and plumbing; unit 6, electrical work. Total cost of project $500,000.

Texas

ATLANTA, TEX.—City, care of E. C. McKinney, secretary, plans extensions and improvements to waterworks, including 200,000-gallon elevated tank, new sanitary sewerage system and sewage disposal plant. Cost $150,000. F. J. Van Zuben, Electric building, Ft. Worth, engineer. (Noted in STEEL, March 21, 1938).

AUSTIN, TEX.—City council voted $60,000 appropriation for construction and changes at city filtration plant to increase peak load to 18,000,000 gallons per day. Work includes $30,000 for valves, piping and controls to interconnect new work with present pumping station and clearing well; $13,500 for mixing equipment including installation; $10,000 for structural work for four new rapid sand filters; and $4,500 for purchasing and installing gates and baffles.

AUSTIN, TEX. — Lower Colorado river authority, room 819, Littlefield building, receives bids April 15 for furnishing penstock headgates, including frames, guides, hoists and hoist supports, and three 18-inch valves to be installed at Marshall Ford dam.

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BRASSERT HOT BLAST STOVE GAS BURNER
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BRASSERT METAL STOVE BOTTOM
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BRASSERT HOT BLAST, CHIMNEY, MIXING AND DROP VALVES
BRASSERT DOUBLE V-TYPE GOGGLE VALVE
EQUIPMENT FOR CLEANING BLAST FURNACE GAS—
VORTEX DRY COLLECTOR
BRASSERT TOWER WASHER WITH SPIRAL TILE
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FT. WORTH, TEX.—Federal power commission, Washington, will make preliminary estimates of cost of electric distribution system for city, W. J. Hammond, mayor. Survey to begin April 10. Transmission line not to exceed 175 miles.

McGREGOR, TEX.—City, care of H. Haynes, secretary, is making plans for complete sanitary sewerage system including sewage disposal plant. Cost $60,000. J. J. Rady, Majestic building, Ft. Worth, engineer.

Kansas

OKETO, KANS. — City, Earl Hedge, mayor, is completing plans for constructing new waterworks system, including wells and 25,000-gallon tank and tower. Will vote on bond issue soon. Paulette & Wilson, 311 Farmers Union building, Salina, consulting engineers.

North Dakota

SHERWOOD, N. DAK. — City, K. R. Flem, auditor, will vote soon on bond issue to finance establishing municipal light and power plant and constructing transmission lines.

South Dakota

FAITH, S. DAK. — City, T. J. Joyce, city auditor, has submitted plans to WPA for approval of constructing filtration plant.

FLANDREAU, S. DAK. — Federal power commission has authorized sale of light plant to the city. City will rebuild plant and add two 375-horsepower diesel engines and generators. Carl Hanson, city auditor. (Noted in STEEL, March 21, 1938).

MITCHELL, S. DAK.—City, T. Eastcott, city auditor, has authorized water commission to purchase new 40-pound chlorinator. J. E. Holst, superintendent of waterworks.

MITCHELL, S. DAK. — City has authorized city engineer, Carlos Scallin, to draw plans and specifications for constructing power feeder line to be built by Northwestern Public Service Co.

Iowa

ANAMOSA, IOWA — State commerce commission will hold a hearing April 12 on application of the Maquoketa Valley Rural Electric Co-operative for permission to construct rural transmission lines in Jones county. A. Parke, Ogden, district secretary.

COMANCHE, IOWA—Village will hold an election on proposition to grant franchise to Peoples Light Co. to build and operate electric light and power system. H. G. McKenrick, city clerk.

DES MOINES, IOWA—Part of the main plant and shed of Des Moines Foundry Co., Seventh and Wabash streets, was recently damaged by fire.

KEOKUK, IOWA—City, B. F. Earl, city clerk, is taking bids to 10 a. m., April 22, for constructing waterworks building and equipment, including pumps, switchboard, wiring, heating boiler, stoker and hoist; also on section 2, distribution system, including mains, valves and hydrants; section 3, elevated storage tank. Brown Engineering Co., Ottumwa, Iowa, consulting engineer.

TREYNOR, IOWA—City will soon make application to WPA for aid in constructing waterworks system. Cost $8000.

Nebraska

BATTLE CREEK, NEBR. — Iowa-Nebraska Light & Power Co., L. R. King, president, has filed application with state railway commission for permission to construct 25.5 miles transmission lines to serve customers in Madison county.

FREMONT, NEBR.—City, A. J. Forman, city clerk, has filed application with state railway commission for permission to construct nine miles transmission lines to serve customers in Dodge county.

GRAND ISLAND, NEBR.—Division of sales and purchases, department of commerce, Washington, takes bids to 2 p. m., April 14, for erecting steel tower antenna system and radio facility buildings near Grand Island, Nebr., and South Bend, Ind. Proposal blanks and plans obtainable from owner.

Idaho

NAMPA, IDAHO—Proposed sewage disposal plant will cost $180,665 according to estimates by L. R. Stockman, Baker, Oreg., engineer. City expects $56,000 WPA funds. (Noted in STEEL, Feb. 28, 1938).

Pacific Coast

FEATHER FALLS, CALIF.—Feather River Pine Mills, A. H. Land, president and general manager, 1250 Montgomery street, Orville, Calif., plans lumber mill. Cost $100,000.

GLENDALE, CALIF.—Glendale city council has ordered plans and specifications drafted for a municipal steam generating plant to provide additional electrical energy which the city is expected to need by the latter part of next year. Plant will have 15,000-kilowatt capacity. Cost between $1,000,000 and $1,500,000.

LONG BEACH, CALIF.—Building permits have been issued for constructing 26 oil well derricks on the Pacific Dock & Terminal property in Long Beach, for Richfield Oil Corp. Total cost $260,000.

LOS ANGELES—A certificate to conduct business under the firm name Western Engineering & Mfg. Co., 1720 East Fourteenth street, has been issued to the owner, Clarence H. Forbes, 149 North Rexford drive, Beverly Hills, Calif.

LOS ANGELES—A certificate to conduct business under the firm name Krieger Bros. Metal Products, 22220 Beverly boulevard, Los Angeles, has been issued to the owners, Emanuel Krieger and Milton Krieger.

LOS ANGELES—A certificate to conduct business under the firm name of Kinney Iron works was issued to the owners. Plant is located at 2552 East Forty-ninth street. Roland T. Kinney, Hadassah T. Kinney, Wendell H. Kinney, owners.

LOS ANGELES—A certificate to manufacture industrial machinery under the firm name of Irving G. King & Co. 2314 East Eighth street, has been issued. Irving G. King, San Gabriel, Calif., Wayne B. Collins, San Gabriel, Calif., Thomas A. Fitch, Los Angeles, owners.

LOS ANGELES—A building permit has been issued for constructing a machine shop at 2901 Santa Fe avenue, Los Angeles, for Cantlay & Tanzola, 2750 Alameda street. Cost without equipment, $16,000.

SEATTLE—Capt. George L. Townsend, supply officer, Alaska communications system, will receive bids here April 15 for furnishing two antenna receiving sets and one transmitting set for installation at Juneau, Alaska.

SEATTLE—Seattle Iron & Metals Co., 2747 Utah avenue, is erecting concrete and frame warehouse, including boiler room and modern equipment. Plans by Jones & Stanley, Seattle.

SEATTLE—Washington Vintners Inc., 703 Fourth Avenue building, has been organized with $25,000 capital. C. E. Cassady, president. Company has purchased a building at Kent, Wash., which will be remodeled for processing fruits and berries. Cost with equipment $75,000.

Canada

SAULT STE. MARIE, ONT.—Algoma Steel Corp., Ltd. soon takes bids on tin plate mill. Cost $2,500,000 to $3,000,000. Private plans.

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